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REPORT

OF THE

LONDON TRAFFIC BRANCH

OF THE

BOARD OF TRADE.

Presented to both Houses of Parliament by Command of His Majesty.

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year 1907, of the principal tables supplied by the Council to the Royal Commission in 1903 and 1904. I am glad to have this opportunity of mentioning that, in this work, I have had every possible assistance from the Council and from its Chief Officers. I am especially indebted to Mr. G. L. Gomme, the Clerk of the Council, Mr. Edgar Harper, the Statistical Officer, Mr. Maurice Fitzmaurice, the Chief Engineer, Mr. W. E. Riley, the Superintending Architect Mr. A. L. C. Fell, the Chief Superintendent of Tramways, Mr. Andrew Young, the Valuer, Mr. H. E. Haward, the Comptroller, and Mr. J. Ollis of the Public Control Department, who all freely gave me information which could not have been obtained without their help. I had many conferences and much correspondence with these gentlemen, and they furnished me, in addition, with plans, statistical matter, and written or printed statements in continuation of the evidence which they gave to the Royal Commission. The statistics and the statements will be found in the Appendix of this Report.

I then conferred with the General Manager, and in some cases, with the Chairman, of each of the Railway Companies concerned with passenger traffic in London. They all gave me willing help, supplied me with particulars of urban and suburban traffic, and of railway working in London, and furnished me with materials—not hitherto available—for the compilation of a diagram, illustrating the volume and distribution of railway suburban traffic in a selected month. This diagram will be found in the Report.

Valuable information was obtained from many other sources ; from Government Departments, from the Commissioner of Metropolitan Police, from members of the late Royal Commission and their Secretary, Dr. Lynden Macassey, who gave me great assistance at the outset, from witnesses who gave evidence to the Commission, from representatives of Local Authorities, and from many others whose special knowledge qualified them to speak with authority upon various branches of the subject. On all sides I was met with a disposition to help which I am glad to have this opportunity of acknowledging. Other sources of information upon which I have drawn are official publications, books, pamphlets, and the daily and technical press.

Arrangements were made with the Director General of the Ordnance Surveys for the preparation of maps to illustrate the Report. The work was done with characteristic accuracy and thoroughness. The production of these maps required great care, and in the case of the Railway Traffic diagram, much calculation.

The Memorandum on the Municipal Government of Washington, which is printed in the Appendix, was prepared from official sources by Mr. T. Fairman Ordish. By the courtesy of Mr. J. Ridgely Carter of the American Embassy, this memorandum was transmitted to the Washington Commissioners, who were good enough to examine and amend it. Another Memorandum on the Municipal Government of Berlin and other German Cities, with special reference to locomotion and town extension, prepared by Mr. W. H. Dawson, is also included in the Appendix. It gives a very full and clear account of the way in which these questions have been dealt with in Germany.

London traffic presents not one, but a number of problems, differing from each other, yet so inter-related, that no one of them can be dealt with without at the same time bearing the others in mind. These problems which all involve social and economic considerations of great magnitude and intricacy, call for incessant vigilance, inasmuch as they are changing in some of their aspects from day to day, and a change in one is liable to affect all the others. A close study of the whole subject tends to support the conclusion that it can only be dealt with effectively by a permanent body giving continuous attention to it in all its branches. In any case, improvement must necessarily

be slow, and might at first be scarcely perceptible. A large amount of preliminary work has to be done before a definite line of advance can be marked out, and a plan devised to which future action can be made to conform. Until that stage has been reached it is difficult to see how progress, adequate to the needs of its vast population, can be made in the orderly development of means of locomotion and transport throughout the area of Greater London.

I have the honour to be
Sir,
Your obedient servant,

HERBERT JEKYLL.

4th September, 1908.

REPORT.

PRELIMINARY.

Report of R. C., I. 3.

Continuous attention necessary.

The Royal Commission on London Traffic draw attention at the outset of their Report to the necessity for continuous attention to ensure that practical measures for improving the traffic conditions of London may be brought into harmony with each other and with a general plan. There is, they say, no finality in the question of the best means of locomotion and transport for great cities. For this and other reasons, which they give in the course of their Report, they come to the conclusion "that the appointment of a permanent body to deal with questions of London locomotion is expedient."

Statistics and information must be kept up to date.

The Royal Commission took a large amount of evidence in the course of their enquiry; they received a Report from the Advisory Board of Engineers, whom they appointed to give them expert and technical advice on certain matters of primary importance; and they collected statistical and other information, profusely illustrated with plans and diagrams. The seven volumes which supplement their own Report contain a mass of information of great value, which, as they say, will facilitate the labours of those who may take up the problem at the point where their investigation stops. Much of the information is of a kind that will not require frequent revision; but some of the statistics and information relating to railways, tramways, public conveyances, street improvements, and other matters, which have an important bearing upon the ever changing conditions of the problem, must be kept up to date if they are to be of use. This has now been done to some extent, and the latest available information will be found in this Report.

Magnitude and Importance of the Problem.

Ib., I. 4.

Area to be dealt with.

In the first chapter of their Report, the Royal Commission give a general indication of the magnitude and importance of the problem of locomotion in London. They refer to the daily movement of the population between the suburbs and the centre as one of its most important features, and define the area with which they propose to deal as that of Greater London, containing 692·84 square miles, and comprising the City of London and the Metropolitan Police District. The Administrative County of London, which includes the City of London and the County of London, covers an area of 116·9 square miles. Its boundaries are irregular, and do not comprise important parts of of the urban area, such as East Ham and West Ham, which are in the County of Essex. The Royal Commission mention that there are 30 independent municipal bodies in the Administrative County, comprising the London County Council, the Corporations of the Cities of London and Westminster, and 27 Metropolitan Borough Councils; while in the remainder of Greater London there are 142 Local Authorities, comprising five County Councils, eight County and Municipal Borough Corporations, 60 Urban District Councils, 14 Rural District Councils, and 55 Parish Councils.

Public Authorities in Greater London.

Ib., I. 5.

Area may require alteration

While confining their purview to the area of Greater London, they expressly state that the limits within which special measures should be taken cannot be finally and definitely laid down, either now or at any future time, inasmuch as the inhabitants tend more and more to reside in the outlying districts, and to travel daily to and from their business in the central area. For this reason they think that means should be provided for extending or modifying, from time to time, the area, subject to special treatment.

Population.

Enumerated population.

The last census, taken in 1901, showed the population of the Administrative County to be 4,536,429, and the population of Greater London to be 6,581,402. The census returns from 1801 to 1901 show that the increase of population in Greater London in each period of ten years was greater than the increase in the previous period throughout the series, the last and greatest being an increase of 947,596 between 1891 and 1901. **Report of R. C., I. 6. and IV., Appendix G.**

Estimated growth.

Estimates of the population for each year from 1901 to 1910, were given to the Royal Commission by the Registrar-General. They are based on the enumerations of 1891 and 1901, and give the anticipated population in the middle of each year to which they relate. These estimates are used provisionally by the Registrar-General, but will be superseded when the results of the next enumeration are available. They may not be wholly trustworthy, and the figures—especially those for the later years—cannot be accepted without reserve.

The following figures are extracted from the Tables.

Year.	Administrative County.	Outer London.	Greater London.
1901	4,544,870	2,061,293	6,606,163
1902	4,578,988	2,126,782	6,705,770
1903	4,613,682	2,192,614	6,806,296
1904	4,648,950	2,258,806	6,907,756
1905	4,684,794	2,325,377	7,010,171
1906	4,721,216	2,392,344	7,113,560
1907	4,758,217	2,459,722	7,217,939
1908	4,795,798	2,527,528	7,323,326
1909	4,833,962	2,595,778	7,429,740
1910	4,872,710	2,664,484	7,537,196

These figures show an estimated increase of population between 1901 and 1910, amounting to 6·73 per cent. in the Administrative County, 22·64 per cent. in Outer London, and 14·09 per cent. in Greater London.[1]

Another calculation, which gives a somewhat smaller rate of increase in the Administrative County, is based on the assumption that the number of houses on the Rate books in the several years bears the same proportion to the population as the number of houses on the Rate books of 1901 bore to the population enumerated at the census. The estimate arrived at in this way is used for the purposes of the London (Equalisation of Rates) Act, 1894.

The future increase in the population of Greater London cannot be foretold with accuracy. According to the Royal Commission the experience of the rate of growth since 1892 tends to show "that the population of Greater London in 1931 may not be much short of 11 millions," while Mr. Harper, the Statistical Officer of the London County Council, estimates it at 9,277,163, but considers that figure to be a minimum. It is certainly growing rapidly. Within the Administrative County it is diminishing in some of the Central Boroughs, such as the City of Westminster, Finsbury, Holborn, Marylebone, and notably in the City of London; it tends to remain stationary in others like Bermondsey, Bethnal Green, Chelsea, Poplar, St. Pancras, and Shoreditch, and it is increasing in Boroughs on the outer fringe. In Outer London the rate of increase is far greater. *Ib.*, I. 6.

Changes of population in different parts.

Rateable value.

As a further illustration of the growth of the Metropolis, the Royal Commission give the rateable value of the Administrative County at various *Ib.*, I. 7.

[1] The areas are—Administrative County, 116·90; Outer London, 575·94; Greater London, 692·84 square miles.

Report of R. C., I. 7.

intervals between 1861 and 1905. The following table brings the information up to 1908 :—

Year.	Rateable Value.		
	City of London. (1)	County of London.	Administrative County of London.
	£	£	£
1901(2)	4,858,312	34,785,306	39,643,618
1904(3)	5,019,371	36,067,603	41,086,974
1905(3)	5,107,182	36,549,884	41,657,066
1906(3)	5,360,197	38,126,239	43,486,436
1907(3)	5,365,776	38,502,766	43,868,542
1908(4)	5,451,820	38,871,885	44,323,705

(1) Including the Inner and Middle Temples.
(2) These figures were given in the Report of the Royal Commission, p. 5, par. 7.
(3) From the vols. of "London Statistics" for those years.
(4) Supplied by the Statisitcal Officer, London County Council.

Provision for Travelling.

Ib., I. 8.

Requirements for locomotion increase faster than population.

The Royal Commission point out that the necessity for additional means of locomotion increases in a higher ratio than that of the growth of population and is "largely due to the gradual abandonment for various reasons of the crowded centres as places of residence, which necessarily involves an increase of the daily movement of the population."

Ib., I. 9.

Increase in amount of travelling.

In the year 1881 the number of passengers carried by local railways, by tramways, and by the principal omnibus companies was 259,662,649, while in 1901 it had increased to 847,212,335. In 1907 the corresponding figure was 1,280,840,179. The following table compiled from figures supplied by Mr. Harper, shows approximately the number of passengers carried in the last five years by the local railway companies, the tramways, and the principal omnibus companies :—

Year.	Number of passengers carried by—				Estimated population of Greater London.	Number of journeys per head.
	Railway (local companies).	Tramway (approximate).	Omnibus (principal companies).	Total (approximate).		
1903	290,722,680	394,356,531	287,386,471	972,465,682	6,806,296	142·9
1904	298,638,750	431,813,839	288,965,214	1,019,417,803	6,907,756	147·6
1905	305,052,495	477,944,684	290,665,051	1,073,662,230	7,010,171	153·2
1906	329,521,648	508,700,269	291,563,048	1,129,784,965	7,113,560	158·8
1907	363,794,894	585,695,285	331,350,000*	1,280,840,179	7,217,939	177·5

* The figures for 1907 include the Vanguard Motor Omnibus Company, as well as the London General Omnibus Company and the London Road Car Company.

Number of journeys per head of population.

From this it will be seen that while the average number of such journeys per head per annum of the population increased from 56·6 in 1881 to 128·7 in 1901, it amounted to 177·5 in 1907. The figures do not include the whole of the omnibus traffic, nor do they include the cab traffic or the large suburban traffic of the trunk railways. Mr. Harper estimated that the total average number of journeys in 1901 would be 200 per head of population. The total average in 1907 can hardly be put at less than 300.(1)

Conclusions.

The main conclusions to be drawn from these calculations are that the population tends to move outwards from the centre, and that the travelling habit of the people is increasing rapidly—stimulated doubtless by the great increase in the facilities for movement which have come into existence in the course of the last few years.

(1) Assuming the number of suburban passenger journeys in the year on the trunk railways to be 750,000,000, the total number of omnibus passengers to be 500,000,000, and the number of cab journeys to be 50,000,000, and adding these to the ascertained number of journeys on the local railways and tramways, a total of 2,249,500,000 is arrived at, equivalent to an average number of journeys of 312 per head.

Importance of facilitating Locomotion.

Existing difficulties, and necessity for dealing with them.

The figures given by the Royal Commission, "taken in connection with the present congestion of traffic in so many of the streets of London; the difficulties which persons residing in the suburbs experience in moving to and from their daily work; the overcrowding of houses in the central area; and the impossibility of housing the working classes in that area at rents which they can afford to pay, are," they say, "conclusive as to the necessity of dealing with the whole problem of London locomotion on a comprehensive plan, and with as little delay as possible." Report of R. C., I. 10.

Congestion of traffic in the streets.

They give instances of congestion in the streets, especially where important streams of traffic cross each other, and figures showing the delay caused by holding up traffic at points of intersection; they state that the continuous growth of vehicular traffic is causing increasing congestion in the streets, with resulting slowness of movement; and that "the burden of delay falls on all passengers, but presses most heavily on the professional and working classes, and especially on those who have to proceed a considerable distance to their work or business every day." *Ib.*, I. 11. Since these statements were made considerable improvements, which will be mentioned in detail, have taken place, and locomotion has been facilitated and quickened, but there has been no perceptible abatement of the congestion of traffic in the streets, which indeed appears to be growing.

The Housing Problem in relation to Locomotion.

The Royal Commission deal at some length with the housing problem as affected by the facilities for locomotion. They find— *Ib.*, I. 12.

Overcrowding.

(1.) That overcrowding is, generally speaking, greatest in the central area, and tends to diminish towards the circumference. *Ib.*, I. 13 (1).

Rents.

(2.) That the average weekly rents for workmen's dwellings are highest in the central and most crowded districts of London, and tend to diminish toward the suburbs. *Ib.*, I. 13 (2).

Value of land.

(3.) "That the price of land in the central districts of London makes it impossible to rehouse the working classes within those districts at rents which they can afford to pay, without a heavy loss to those who undertake the rehousing. Also that the price of land a few miles out is still sufficiently low to admit of rehousing, without loss, at rents which the tenants can afford to pay." *Ib.*, I. 13 (3).

Rehousing schemes.

The Royal Commission illustrate this point by comparing the financial results experienced by the London County Council of rehousing on the Bourne Estate (1) in connection with the Holborn and Strand improvements, and of housing at Tooting. In the first, the cost of a three-roomed tenement worked out at £761 12*s.* 6*d.*, while in the second the cost of a three-roomed cottage worked out at £263 10*s.* The Tooting scheme is self-supporting, while in the case of the Bourne estate there is a loss of nearly £60 per head of the persons rehoused, the whole of which falls upon the rates. The London County Council have had the same experience in every other housing scheme that they have undertaken. Wherever they have had to provide workmen's dwellings in the central districts there has been a heavy loss, and in effect the rents are largely paid out of the rates. Outside the central area the schemes have been self supporting. The Commission show by a tabular statement that in the central districts the ratepayers have sustained a loss of £412,683 in rehousing 7,586 persons on 18·55 acres; in the suburbs the Council have housed 1,797 persons on 14·15 acres without any charge on the rates—in the one case, a great waste of public money and a still crowded population, in the other, no loss of money and a population housed in healthy surroundings. "It is not practicable," they say "to rehouse the working classes in the central districts at economic rents, while in the outer zones rehousing can be effected without loss if means are provided to enable workmen to get in and out of London quickly and cheaply."

(1) The site of Reid's Brewery adjoining Theobald's Road

The Royal Commission mention that the practice of rehousing required by past legislation appears to have been based upon the assumption that the persons displaced in consequence of an improvement or a clearance, will occupy the new buildings. This is not the case, and they cite the example of the Boundary Street area, Bethnal Green, where out of 5,719 persons displaced, only 11 returned to the new building. A discretion is now vested in the Local Government Board by the Housing of the Working Classes Act, 1903, which enables them to authorise rehousing at a distance, but it cannot be generally exercised without facilities for locomotion.

Report of R. C., I. 13 (4). (4.) "That a large proportion of workers in the overcrowded parts of London do not need to live near their work." *Workmen can live outside Central Area.*

Ib., I. 13 (5). (5.) That where facilities for locomotion have been afforded, the population does, in fact, take advantage of them to live outside London. *Many do where means for locomotion exist.*

The Royal Commission came to the conclusion that the remedy for overcrowding is to be found in removal of the people to outside districts by providing additional facilities for locomotion, but they point out— *Remedy for overcrowding.*

Ib., I. 14. (*a.*) That railway companies are not generally prepared, nor can they be compelled, to construct lines leading to unoccupied or sparsely occupied districts, and there is no power under the Cheap Trains Act, 1883, to order the running of workmen's trains unless a demand for such trains exists. Accordingly many places, suitable for building, are not accessible by railway; and others that are accessible, cannot be utilised by the poorer people owing to want of trains of sufficient cheapness and frequency. *Difficulty in providing communication by railway.*

(*b.*) There has been a great aggregation of the working classes in those districts which have been opened out, especially in the East and North East of London. *Injurious consequences.*

(*c.*) The poorer people being limited in their choice of residence, crowd to places where they can get facilities for locomotion; hence the rateable value of such districts is low, and the rate in the pound high in proportion.

Ib., I. 15. (*d.*) If there were facilities for going out in all directions the demand for housing would be more dispersed, and the rents payable by the working classes would be kept within moderate limits. *Facilities for locomotion tend to keep down rents.*

Ib., I. 16. The Royal Commission mentioned two suggestions, made to them in evidence, one that Railway Companies ought to be allowed to buy land in order to obtain for themselves a portion of the additional value which the construction of a new line creates; the other that the London County Council should be empowered to dispose of land, acquired under the provisions of the Housing of the Working Classes Act, 1903, in the most profitable manner. They point out that Parliament has authorized the London County Council to recoup themselves by acquiring land adjacent to projected improvements, and that some recoupment of the great cost of new Railways might be obtained by the judicious acquisition of land intended to be opened out for building. *Acquisition of land by railway companies. Restrictions on disposal of land purchased by London County Council.*

Ib., I. 17. Whatever view may be taken of such suggestions, the Royal Commission are of opinion "that in order to relieve overcrowding, means must be provided for taking the population in and out of London, not in one or two directions, but in many directions, at rapid speed, frequent intervals, and cheap rates." They point out that if adequate means of locomotion were provided, regulations against overcrowding could be more stringently enforced in crowded districts, many people would reside at a distance from their work, and there would be inducements to manufacturers and others to move their businesses to localities where houses could be built and let to workmen at rents which they could afford to pay. "It cannot be right," they say, "to promote by an indirect subsidy the retention of factories and businesses in the overcrowded parts of the Metropolis, where without such assistance they can no longer be carried on at a profit. The provision of houses at less than cost price, in crowded localities, must tend to check the movement, which has already begun, for the removal of certain classes of work to the outskirts of London or even beyond them." *Greater facilities for locomotion required. Would enable regulations against overcrowding to be enforced.*

Ib., I. 18. The Royal Commission state that under present conditions one-third of the tenants of the London County Council's houses change their place of abode every year. A general improvement in the means of locomotion would obviate *Want of means of locomotion causes frequent*

change of residence.

the necessity for change of residence when the place of employment changes, and would enable families to live in cottage dwellings which are obviously more desirable than block tenements.

Question of locomotion concerns all classes.

They add that, "the importance of facilitating rapid and cheap locomotion is not a matter that concerns only the working classes. It materially affects the health, comfort, and efficiency for work, of the whole community." Facilities for locomotion are even more required in London than in other cities, "and if the standard of movement cannot be raised to the level attained elsewhere, London must fall behind in competition with other cities, and the life and growth of the Metropolis will be slowly, but not the less surely strangled, by the choking of the great Arteries of Traffic." **Report of R. C., I. 19.** ***Ib.*, I. 20.**

Especially important in London.

Density of population.

Referring to the overcrowding of population in the Metropolitan area, the Royal Commission state that "according to tables furnished by the Statistical and other Officers of the London County Council, it appears that the population per acre in the central area of London is 148, in the rest of the County (excluding North Woolwich), 16·6, and in the rest of Extra London 2·5"; and they add that "the overcrowding, speaking generally, increases or diminishes in accordance with the density of the population per acre." The Report of the Board of Trade on the Cost of Living of the Working Classes issued in January, 1908, contains much valuable information on the density of population in London, the rents of working class dwellings, and the cost of living generally. A table compiled from information contained in the Report, which will be found in the Appendix[1], shows for every Metropolitan Borough, and certain districts in Outer London, the area, the enumerated population in 1901, the estimated population in 1906, the number of persons per acre in both years, and a figure representing the relative cost of rent. ***Ib.*, I. 13.**

STREETS AND ROADS. NECESSITY FOR A PLAN OF IMPROVEMENT.

Insufficiency of Street Accommodation.

Narrowness of streets.

The chief difficulty in the way of improving the means of locomotion in London is—as the Royal Commission point out—"the narrowness of the streets, and the fact that they were not originally laid out on a regular plan." If, they say, "the streets were of sufficient width, and had been laid out on a regular plan, the congestion of vehicular traffic would practically disappear." ***Ib.*, I. 21.**

Want of an authority competent to deal with locomotion.

They add that "the present unsatisfactory conditions are largely due to the fact that there did not exist in the past any municipal or other authority of sufficient power and resources to enable it to deal satisfactorily with the problem of locomotion and the other questions allied thereto." In another part of their Report the Commission summarise the situation in the following words: "The evils to be met are undoubtedly becoming more serious every year. There is great delay and congestion in the vehicular traffic inside London, and great difficulty in conveying passenger traffic each morning and evening into and out of the Metropolis. The population is becoming larger, and the number of those who live outside and come into London daily for their work is increasing, and will tend still more to increase, unless the natural movement from crowded centres to the more open country outside, so desirable for economic and sanitary reasons, is arrested from want of facilities for locomotion. It is not only mitigation of the existing evils that is needed, but provision to meet the growing wants of the future, and prevent a repetition of the mistakes that have been made in the past." In submitting their recommendations as to street improvements, they observe that "at the root of the problem of London locomotion lies the fact that many of the streets of London are too narrow." ***Ib.*, I. 22.** ***Ib.*, I. 60.** ***Ib.*, I. 65.**

Evil is increasing.

Provision for the future.

Narrowness of streets causes congestion of traffic and delay.

They point out how congestion caused by the narrowness of the streets affects the speed of vehicles, and mention the difficulty in finding room for tramways on the surface, or for railways just beneath the surface of streets that are crowded with traffic above and filled with pipes below. "It is clear," they say, "that if it be practicable to pierce new arterial streets, and to widen existing streets, every kind of locomotion will be facilitated; the question is, how far it is practicable to do this, and how fast it can be done."

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(1) Appendix A—VI.

Intersecting Lines of Traffic.

Report of R. C., I. 81, VII., pp. 63–65.

If narrowness of the streets is the main cause of congestion of traffic, another fruitful cause of delay, to which the Advisory Board of Engineers drew attention, exists where vehicles going in different directions cross each other. The Advisory Board give a number of instances of such places and suggest specific remedies, which, as a rule, involve engineering works of considerable magnitude. The Royal Commission observe that "relief in such cases could be afforded either by raising or sinking one of the existing roads or by enlarging the central space where the different lines of traffic converge." They appear to favour the second alternative, and point to the comparative freedom from interruption at places like Trafalgar Square, Parliament Street, and Hyde Park Corner. To these instances may now be added Marble Arch, where the recent enlargement at the junction of Oxford Street, Bayswater Road, Edgware Road, and Park Lane, has effectually relieved congestion at a point where delay and obstruction were formerly prevalent. The enlargement of circuses and the widening of streets at junctions would undoubtedly afford sensible relief, as they would allow traffic to cross on a broader front.

Relief of congestion at crossing places.

Ib., I. 82.

The Cost of Improvements.

Ib., I. 61.

The Commission were strongly impressed with the financial aspect of the problem. "If," they say, "considerations of money could be disregarded, it would be easy to apply the remedy at once"; and again, "there is no physical obstacle that could not be easily overcome by engineering skill: the difficulty is simply one of money." After reviewing the expenditure on improvements incurred in the course of fifty years by the Metropolitan Board of Works, the London County Council, and the Corporation of the City of London, the Commission mention that the debt charge for street improvements, bridges, tunnels, embankments, ferries, &c., upon the county rate, which had largely increased in recent years, amounted for the year 1902–3 to £659,521, which is equivalent to a rate of 3·94*d.* in the pound on the assessable value in April, 1902. They further state, on the authority of the London County Council, that "although the traffic requirements of London in respect of widening and opening streets have not nearly been met, the existing charge is as high as the ratepayers can bear."

Consideration of cost.

Ib., I. 62.

Debt charge for street improvements

In the year 1906–7 the debt charge for street improvements, &c., was £919,381, which is equivalent to a rate of 5·08*d.* in the pound on the assessable value. A large part of the considerable increase that has taken place since 1902–3 is stated by Mr. Harper, the Statistical Officer of the London County Council, to be due to the expenditure on the Holborn to Strand improvement, and on the Rotherhithe Tunnel. In the case of the former the debt charge is at present exceptionally heavy owing to the large amount of surplus land as yet producing no rent.

The total average rate levied in the Administrative County of London rose from 7*s.* 1·5*d.* in 1905, as stated by the Royal Commission on the authority of Mr. Harper, to 7*s.* 2·8*d.*, as stated by him in 1907–8. The total rateable value of the Administrative County in 1904 was £41,086,974. On the 6th April, 1908, it was £44,323,705, the assessable value being £44,315,905, subject to appeals still outstanding.

Average rate in administrative county.

Ib., I. 62.

"The London County Council," the Royal Commission say, "are of opinion that if they cannot find some new source of revenue the necessary improvements will be seriously checked." They do not themselves suggest any new source of revenue, but they mention the taxation of land values recommended by the London County Council, which the latter estimate would yield about £250,000 a year, at a rate not exceeding 4*d.* in the pound; and the reimposition of the Coal and Wine duties, advocated by some witnesses, which, if levied upon the old scale, would probably yield more than £500,000 yearly.

Suggested sources of revenue.

They also mention as a possible source of revenue the imposition of a special improvement rate on the principle known as "Betterment." The application of this principle to London, though advocated by the London County Council, was not admitted by Parliament until 1895. As recently as 1893 Parliament refused to sanction the betterment clauses of the Council's Bill for the reconstruction of

"Betterment."

Vauxhall Bridge, and in 1899 the application of the principle to the Holborn and Strand improvement was admitted to a very limited extent. Mr. Andrew Young, Valuer to the London County Council, gave evidence on the subject to the Royal Commission, and put in a table showing the improvements where betterment had been applied. At that time there had been no case in which betterment had been assessed, but there have been two cases since, and these are referred to in Mr. Young's supplementary statement, which will be found in the Appendix (1). In the same statement, he draws attention to the increased value conferred upon a plot of land by improvements carried out by the Council. Before the improvement the land was leased at a rental based upon a valuation of 2*s.* 6*d.* per foot super. After the improvement the property changed hands on the basis of 6*s.* per foot super.

Examples of Metropolitan Improvements.

Metropolitan improvements come mainly under four heads—Widenings, New Streets, Bridges, and Tunnels. What works of this character involve in the way of cost and in other respects may be gathered from a recent example of each.

Widening of Piccadilly.

Piccadilly affords a good instance of the widening of an important street carrying a heavy volume of traffic. The section between the Green Park and Piccadilly Circus in nearly 2,000 ft. long, and has a width varying between 81 ft. at the widest and 52 ft. at the narrowest. The intention, partly accomplished, is to give the street a minimum width of 80 ft., increased for a length of 280 ft. at the western end to from 85 ft. to 91 ft. The widening commenced in 1902, when certain leases on the Crown Estate at the eastern end were due to fall in. Advantage was taken of this fact by the London County Council to make with the Crown a comprehensive arrangement for widening on the north side from the Circus to No. 37, near Sackville Street. The widening by the Piccadilly Hotel is the result of this arrangement so far as the expiry of the leases has permitted the improvement to be made. On the south side a similar arrangement was made on the Crown Estate, between Duke Street and the old Norwich Union Offices. Part of the widening has actually been effected. A further part adjoining this is now due to be carried out. About the same time that these arrangements were made, certain other properties were about to be redeveloped. These were the Norwich Union property on the east side of St. James' Street, the Royal Insurance property on the west side of the same, and the property between Arlington Street and the Green Park. The widenings here were arranged on the basis of a purchase of land only, but in the two cases at the corners of St. James' Street, the matter was settled as if under compulsory powers. The widening is being effected under extremely favourable circumstances of purchase of cleared land, largely from landowners anxious to assist the improvement. The estimated cost of the land is £345,700 and of works £12,950, making a total of £358,650, to which will have to be added the expense of acquiring small strips of land at the corners of Arlington and Sackville Streets.

Construction of Kingsway and Aldwych.

Kingsway and Aldwych (2) which were opened for traffic on the 18th October, 1905, afford an example of a different kind, namely entirely new thoroughfares pierced through an area previously covered with buildings and intersected by narrow and tortuous streets. It gives direct communication between Holborn and the Strand, and is one of the most important improvements that have been carried out in London since the completion of Regent Street in 1826. The completed thoroughfare, including side streets, is about 4,200 ft. in length, and the width of the principal streets is 100 ft. throughout, with the exception of a short distance in Southampton Row, where it is 80 ft. The need for improved communication between Holborn and the Strand had long been felt ; the question of providing it had been under consideration for 60 years ; and many schemes had been proposed at different times ; but it was not until 1898 that a definite plan was decided upon by the London County

(1) Appendix C—VIII.

(2) Printed account of Kingsway and Aldwych by the London County Council, issued on the occasion of the opening ceremony, 18th October, 1905.

Council. Statutory powers were obtained in 1899, and negotiations for the acquisition of property were at once proceeded with. The scheme included the clearance of insanitary areas in the neighbourhood of Clare Market, which entailed the displacement of 3,172 persons of the working class, while 3,700 more were displaced in the course of the formation of the new street, and provision had to be made for rehousing all these people. The operation further involved the acquisition of freehold and leasehold properties; and the compensation of trade and other interests numbering fifteen hundred in all. Six hundred buildings were acquired and demolished, and the total area of property dealt with was 28 acres, of which 12¼ were dedicated to the public in the form of new streets, leaving 15¾ available for building sites.

Advantage was taken of the opportunity, which an area freed from buildings affords, to construct a shallow subway under the new street, to admit of the extension of the tramway line from the junction of Theobald's Road and Southampton Row to the Strand, and ultimately to the Victoria Embankment. It was foreseen that such a line would enable the connection, which it was so desirable to establish, to be made between the tramway systems north and south of the Thames. Additional powers were accordingly obtained in 1902, and the tramway subway was constructed concurrently with the formation of the new streets. Subways for pipes were also made on both sides of the main subway, with sewers below them. The work may thus be said to embody all the features of the best type of modern street construction.

The gross cost of the improvement was originally estimated at £4,862,500, and the net cost, after allowing for recoupment, at £774,200. The gross estimated cost is now put at £5,136,150, which it is said will not be exceeded, and the estimate of £774,200 for the net cost is adhered to. In arriving at this amount the London County Council have not considered the effect of delay which may occur in the disposal of the surplus land, nor has allowance been made for interest on the outlay. The net charges for interest from the 1st April, 1899, to 31st March, 1907, amounted to £662,691.

Considerations affecting widening of old and formation of new streets.

It is difficult to make any direct comparison of the relative advantages of widening old, and making new streets. Both operations are necessarily costly. It is often supposed to be more economical to make a new street if enough land is taken, but the expectation that the disposal of valuable sites fronting an improvement repays, or nearly repays, the original outlay is seldom borne out by experience. The most striking example of success attending an operation of this kind is Northumberland Avenue, (1) where the amount realised by the disposal of surplus land exceeded the cost of the improvement by £119,000. This amount was, however, arrived at without taking the charges for interest on the outlay into account, and these charges could not have been small, since some six years elapsed after the completion of the improvement before any of the surplus land was let. The satisfactory result in this case was mainly due to the fact that the operation did not involve the acquisition of valuable trade interests, and that land in such a central situation was much in request. The street, moreover, is short. A new street of considerable length is apt to fill up slowly, and as years may elapse before all the building sites are disposed of, a large addition to the net cost may have to be made by way of interest.

The expense of widening an old street—heavy as it may be—is usually less uncertain in amount, and entails a smaller initial outlay, but no general rule can be laid down as to the comparative expediency of widening and new construction, since the value of property varies greatly in different parts, and so much depends upon the extent of the improvement, the character of the neighbourhood, the interests that have to be acquired, the prospects of development, and other considerations peculiar to the locality.

Vauxhall Bridge.

The old bridge at Vauxhall, (2) the first iron bridge built over the Thames, was opened for traffic in 1816. It was 809 feet long and 36 feet wide and was formed of nine arches, each with a span of 78 feet 6 inches, supported on heavy stone piers. It became necessary to replace it with a new bridge for three

(1) *See* History of London Street Improvements by P. J. Edwards, 1898, p. 57.

(2) Description of Vauxhall Bridge by the London County Council issued on the occasion of the opening ceremony, 26th May, 1906.

reasons, first because the small span of the arches hindered traffic on the river; secondly because the scour of the tide, caused by the number and thickness of the piers, threatened to undermine the foundations; and thirdly because the narrowness and heavy gradients of the bridge impeded the road traffic, which was rapidly increasing in volume. Measures had been taken at various times to maintain the stability of the piers, but they were only partially successful, and in 1892 it become evident to the London County Council that nothing short of the entire reconstruction of the bridge would remove the danger and inconvenience, and at the same time satisfy the growing requirements of traffic. After one abortive attempt, the necessary Parliamentary powers were obtained by the Council in 1895.

Before the demolition of the old bridge could be commenced, an alternative route had to be provided for traffic during the progress of the works. A temporary wooden bridge between the Albert Embankment and Millbank was accordingly erected at a cost of £38,721, and was opened to the public in August, 1898. The work of demolishing the old bridge was then taken in hand, and this work, together with the construction of the new piers and abutments was completed in November, 1903, at a cost of £167,675. The tender for the superstructure amounted to £142,942, the order to commence was given in January, 1904, and the completed bridge was opened for traffic in May, 1906. The bridge, which was designed by, and erected under the supervision of, Mr. Maurice Fitzmaurice, C.M.G., the Chief Engineer of the London County Council, was a work of considerable difficulty, owing to the unsatisfactory character of one of the abutment foundations, and trouble with some of the piers, which in one case led to the collapse of a dam, entailing some delay in the commencement of the superstructure.

The total length of the new bridge between abutments is 759 feet 4 inches, and the width between the parapets is 80 feet, divided into a carriage way 50 feet wide and two footways of 15 feet each. The bridge has five spans, of which the central span is 149 feet 7 inches wide, with a headway of 20 feet above high water. The gradients are 1 in 40·75 on the Surrey side and 1 in 37·29 on the Middlesex side.

Rotherhithe Tunnel.

Prior to the opening of Rotherhithe Tunnel (1) in 1908, the only means of crossing the Thames below London Bridge, open to vehicular and pedestrian traffic, were the Tower Bridge and Blackwall Tunnel; and the only other means of crossing open to pedestrians, apart from ferries, was the tunnel between Greenwich and the Isle of Dogs. The Thames Tunnel had been sold to the East London Railway Company in 1865, and the Tower Subway had been closed in 1897.

The Tower Bridge and Blackwall Tunnel are three and a half miles apart, and the want of an intermediate crossing for vehicular and pedestrian traffic had long been felt. A large amount of merchandise, destined for the south side of the river, was discharged at the docks on the north side, and had to be carted through narrow streets by circuitous routes, while the needs of a population numbering more than half a million, living on both sides, called for consideration.

For many years the question of providing additional means of communication across the river had engaged the attention of the Metropolitan Board of Works and the London County Council, and proposals had been submitted to Parliament at various times; but it was not until the year 1900 that statutory power was given to the London County Council to construct the Rotherhithe Tunnel. Further powers, for acquiring additional property, in compliance with the requirements of the Act of 1900, were given to the Council in 1901, preliminary negotiations and arrangements were completed early in 1904, and the order to commence was given in the month of April in that year.

The new thoroughfare is situated nearly midway between the Tower Bridge and Blackwall Tunnel, in the most convenient position with reference to the docks on both sides of the Thames. It commences at Lower Road, Rotherhithe, and terminates in Commercial Road, Stepney, uniting two of the busiest thoroughfares on opposite sides of the river. The total length is

(1) Description of Rotherhithe Tunnel, by the London County Council, issued on the occasion of the opening ceremony, 12th June, 1908.

6,883 feet, of which 2,020 feet is open approach, 1,122 feet cut and cover, and the remaining 3,741 feet, tunnel. The under-river portion, about 1,500 feet long, crosses under the Thames in a diagonal direction. The outside diameter of the cast-iron lining is 30 feet, and the internal diameter of the finished tunnel is 27 feet. The roadway is 16 feet wide between the kerbs, which gives sufficient width for two lines of the heaviest cart traffic. The footways on each side have a width of 4 feet 8½ inches. The space between the roadway and the bottom of the cast-iron lining forms a subway available for pipes and cables. The tunnel is lit by three rows of incandescent electric lamps. Access to it can be gained by foot passengers at six different points.

The construction of this, the largest subaqueous tunnel in existence, was a work of great engineering difficulty. In the centre of the Thames the top of the tunnel is only seven feet below the bed of the river, yet so carefully was the work carried out that at no time did the river break in. It was completed in four years—a year and a half under the contract time—and was designed by, and constructed under the supervision of Mr. Maurice Fitzmaurice, C.M.G., Chief Engineer of the London County Council, who furnished a statement from which the particulars given above are taken. The total cost of the work including property was about two millions sterling. The formation of the approaches involved the widening of streets on both sides of the river, entailing the displacement of 2,842 persons of the working class for whose rehousing provision had to be made. The tunnel was opened for traffic on the 12th June, 1908. Two days afterwards nearly half a million pedestrians passed through it in the course of 12 hours.

Magnitude and cost of Metropolitan improvements.

The works referred to above have been described in some detail to give an idea of the magnitude and cost of first class Metropolitan improvements. Here are four separate undertakings of the London County Council, three of which have been brought to completion in the space of less than three years, while the fourth has made considerable progress. The gross cost of the four approaches eight millions sterling, while the ultimate net burden on the rate-payers will exceed three and a half millions, not including interest on the outlay which has to be paid until surplus land is disposed of. The number of similar works that might be carried out with advantage might be multiplied indefinitely. The Royal Commission observed that "whatever pains be taken to secure for the community the benefit of enhanced values created by its own expenditure, the net cost must be heavy," and again "It is evident therefore that considerations of finance must be carefully weighed in any proposal for improvement." In view of the figures given above, these conclusions will hardly be disputed.

Report of R. C., I. 63.

Methods of carrying out Metropolitan Improvements.

Improvements carried out by the London County Council and the Local Authorities.

Metropolitan improvements are, as a rule, executed either by the London County Council with or without contributions from the City or Borough Councils, or by the Local Authorities with or without assistance from the County Council. Between June, 1903, and the end of the year 1907, 36 improvements were practically completed by the London County Council at a gross cost of £9,268,181, reducible by recoupment to a net cost of £4,329,781, of which the sum of £492,371 was contributed by the Local Authorities. These improvements, of which a complete list is given in the Appendix,(1) comprised works of the first order of importance, such as the Holborn and Strand scheme referred to above, and others of varying magnitude, consisting mainly of street widenings, the construction of secondary bridges, etc. Thirty-nine other improvements of a similar character are now being carried out by the London County Council at an estimated gross cost of £3,289,394 reducible by recoupment to an estimated net cost of £2,422,450, of which £378,600 falls to be provided by the Local Authorities. A separate list of these works will also be found in the Appendix.(1) Thus, since June, 1903, the London County Council has effected, or is in the course of carrying out, 75 street improvements estimated to cost £12,557,575 gross, and £6,752,231 net without counting such works as Vauxhall Bridge and Rotherhithe Tunnel.

(1) Appendix C.—v.

The Council has also agreed to contribute the sum of £1,029,318 towards the cost of 462 smaller improvements, mainly street widenings, carried out by the Local Authorities. 65 of these improvements are enumerated in a list which will be found in the Appendix, (1) and to the expense of 41 of these the Council contribute. The total cost of these 65 works amounts to £574,916.

Still more numerous are the widenings of existing streets secured by the Council in the exercise of powers conferred upon them by the London Building Act of 1894. These additions to the public ways, which are obtained free of cost in return for concessions allowed under the Act, though individually small in extent, make up a considerable aggregate.

Improvements carried out by the Corporation of the City of London.

Metropolitan improvements are by no means confined to works carried out by municipal authorities at the expense of the rates. Sir Joseph Dimsdale has drawn attention in his separate report, annexed to the Report of the Royal Commission, to the large sums expended on the construction of bridges, viaducts, street improvements, and other works by the Corporation of the City of London out of corporate funds without any charge upon the rates. Improvements, which have resulted in benefit to the public, have been carried out by private landowners in connection with the development of their estates, and some of the most important have been executed through His Majesty's Commissioners of Woods and Forests or His Majesty's Commissioners of Works at the expense of public funds, or out of funds provided by the levy of duties on coal and wine. The memoranda furnished by these Departments, printed in the Appendix (2) give particulars of some of the improvements carried out by them in the course of the last hundred years, but the lists are far from being exhaustive. The following examples may be quoted.

Report R. C., I. 110 and 111.

By landowners.

By Departments of the State.

Regent Street.

Regent Street, from Portland Place to Pall Mall, formed under the powers of the new Street Act, 1813, was completed in 1826. The cost of purchasing property and the interests therein, of acquiring leasehold and trade interests in a considerable amount of Crown property used in forming the street, and of making the street and sewer, amounted to £1,533,582. About the same time the Crown estate on the east side of the Regent's Park was laid out for building, and various streets, now public, were formed, such as Park Crescent, Albany Street, Osnaburgh Street, Augustus Street, and parts of the Marylebone Road.

Charing Cross and Strand improvements and others.

The Charing Cross and Strand improvements, comprising the formation of Trafalgar Square; the extension of Pall Mall; widenings of the Strand; and the formation of King William, Adelaide, and Duncannon Streets, were carried out under an Act of 1813 extended by an Act of 1826. At the same time street improvements were made at Downing Street, King Street, Bedford Street, York Street, Tavistock Street, and Piccadilly. The expenditure on these improvements appears to have been £1,204,882, exclusive of Crown property taken for the improvements.

New Oxford Street and other improvements.

New Oxford Street between Tottenham Court Road and High Holborn was formed between 1840 and 1847 under Acts of 1840 and 1841. Under the same powers Cranbourne Street was formed between Coventry Street and Long Acre,—the latter was extended to Charlotte Street, and streets were made between the London Docks and Spitalfields Church, and between East Smithfield and Rosemary Lane at a cost of about £994,300. A further sum, of which £100,976 appears to have been expended up to 1851 on the formation of a new street from Spitalfields to Shoreditch, was spent under the powers of an Act of 1847.

Various improvements executed by Commissioners of Woods and Forests and Commissioners of Works.

In 1844 Piccadilly, between Bolton Street and Park Lane, was widened by the Commissioners of Woods and Forests to a uniform width of about 70 feet by taking in a strip of the Green Park. In 1852–3 improvements were effected near Buckingham Palace, and Buckingham Palace Road was formed. In 1859 and 1860, Westminster Bridge was built, and additions was made to the roadways of Parliament Street, Bridge Street, and New Palace Yard. In 1865 Parliament Street was widened by the removal of an island block between Downing Street and Charles Street. In 1867 the southern part of Abingdon

(1) Appendix C.—VI.
(2) Appendix D.

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by an easy process of evolution. Two reports, which will be found in the Appendix, one on Berlin and other cities in Germany by Mr. W. H. Dawson, (1) and the other on Washington by Mr. T. Fairman Ordish, (2) give full accounts of the methods adopted in both places. They also describe the systems of municipal Government, both differing widely from our own, under which the results have been achieved; and they show that the allied problems of locomotion and town extension were grappled with and solved in Germany and in Washington long before the existence of such problems was even recognised in London.

Necessity for a Comprehensive Plan of Street and Road Improvement.

Want of a plan of improvement in London.

Unlike foreign cities, which have been remodelled and developed upon well defined lines, the improvement of London, like its growth, has proceeded in accordance with no preconceived design. On this point the Royal Commission express their agreement with the suggestion of the Advisory Board of Engineers "that street improvements should be undertaken in conformity with a carefully considered plan, designed to meet the requirements of through traffic, which may be carried out over a long series of years." The progress of a work of such magnitude, entailing as it does the expenditure of enormous sums of money, must necessarily be slow. Moreover, no plan could be made either now or at any future time which could be regarded as definite and final. "It stands to reason," the Commission say, "that any plans, however skilfully devised, which aim at taking effect over a long period of time, may in some degree require modification in the light of experience, or owing to changes of conditions; the point is to secure that, in future, new streets shall be constructed and improvements in old streets shall be effected, not haphazard and piecemeal as hitherto, but in relation to the general needs of London, and in pursuance, so far as possible, of a fixed policy, which should be followed with persistent effort over a great length of time."

Report of R. C., I. 67 (2).

Plan must be modified to suit changing conditions.

Ib., I. 67.

Necessity for enquiry.

These observations all point to the necessity of a plan which, as the Royal Commission remark, "must of necessity involve prolonged and minute enquiry." Nothing, however, has so far been done to prepare a general plan for future guidance. Mr. Riley, the Superintending Architect of the London County Council, who appeared as a witness before the Royal Commission, has supplemented the evidence which he gave in 1903, with a memorandum, which is included in the Appendix. (3) In regard to the preparation of a plan, he states that "the need for steps to be taken in this direction is urgent, in order to prevent the creation of further obstacles to the future widening of existing streets, and to ensure that new streets may be laid out so as to co-ordinate with a general scheme." Objections to such a plan have been raised on the ground that it would afford information which might lead to the creation of new interests, giving a fictitious and inflated value to properties that would have to be taken in the execution of improvements. Though the danger is not to be disregarded, means could doubtless be found to meet it, and it is hardly one that could be held to outweigh the advantages which have been found by experience to attend the embodiment of a comprehensive scheme of improvement in a well considered plan. (4)

Ib., I. 68.

Objections to a plan.

By whom should plan of improvements in the administrative county be prepared.

London County Council best qualified to undertake the task.

Mr. Riley raises a further question as to who should be responsible for the preparation of a plan of this kind, and suggests that the duty would naturally devolve on the London County Council. The suggestion is one to which exception can hardly be taken. The Royal Commission expressed the opinion that the preparation of a comprehensive plan "must be undertaken by those responsible for the work." So far as the Administrative County of London is concerned, the London County Council alone possess the necessary equipment, whether in regard to their familiarity with the needs and conditions of London, or to their command of an efficient staff of highly qualified officers. There is, moreover, the consideration that it would fall to them to carry out the work and to provide the necessary funds. No other body could approach the task with

Ib., I. 68.

(1) Appendix E.—I. (2) Appendix E.—II. (3) Appendix C.—VII.

(4) Owing to the limit of period in this Report, it has not been deemed desirable to refer in the text to the bearing upon this subject of the Bill dealing with Housing, Town-Planning, &c., which has been introduced into Parliament by the President of the Local Government Board in the Session of 1908.

an equal hope of producing a plan which would either meet the necessities of the case, or command such a measure of assent as would ensure its being carried into execution. The County Council would doubtless, as suggested by Mr. Riley, consult the Metropolitan Local Authorities in the course of the enquiry which must precede the actual work of planning.

Plan of Outer London.

In Outer London the adoption of a definite policy in regard both to thoroughfares for through traffic and to the orderly development of building areas is, if possible, even more urgent than it is in the Administrative County, and in this case also the indispensable preliminary to improvement is a plan. The two problems are, however, different and call for different treatment.

Difference in problem within and without the Administrative County.

In the central area of London the principal need is for wider thoroughfares. Outside the central area, where the land is not so closely built upon, the main requirements are the provision and preservation of outlets giving free communication in all directions between London and the surrounding country, coupled with a proper control of building operations. In the first case the evil has come into existence and the cure must be slow and costly; in the second the evil is growing, and the remedy is not so much cure as prevention. The Royal Commission express entire concurrence with the following observation of the Advisory Board of Engineers—"At the present time, in the absence of some controlling authority, the width of roads in many of the suburbs is defined merely with reference to local convenience and the wishes of the owners of building sites. In these cases we see being enacted under our eyes the same want of provision for arterial necessities and of thought for the future under which the Metropolis itself is suffering at the present time." The Royal Commission deal with this branch of the subject in relation to the building laws, which in their opinion require amendment. They point out that it is owing to neglect in regard to the proper laying out of streets, when ground previously unoccupied by houses is being built upon, "that the question of providing facilities for locomotion is one of such extreme difficulty in the present day," and they add that "building is continually going on in the suburbs, and no time should be lost in arranging that all new streets shall be laid out in accordance with a proper plan, and that they shall all be of a sufficient width." Again "sufficient provision is not made to ensure that new streets and roads shall be laid out so as to give sufficient through communication by means of main roads: the main thoroughfares leading from London to the adjoining counties have never been laid out with reference to any general plan, and are in many respects very unsatisfactory. The yearly increase in the number of houses erected in new and narrow streets throws additional work on the main roads for which they are not fitted. The importance of having suitable main roads leading out of London will increase every year, owing to the general growth of traffic, the increase in the number of motor vehicles, and the extension of tramways." They recommend that "in the case of roads that have not yet become streets, a sufficient width, free of buildings, should be reserved to provide for future requirements," and as regards the main roads leading out of London that "the proposed Traffic Board should be requested to consider the whole question, and report to the Local Government Board, stating what, in its opinion, ought to be done in the way of making new roads and improving existing roads."

Report of R. C., I. 88.

Evils arising out of want of control.

Ib., I. 85.

Ib, I. 87.

Importance of main roads leading out of London.

Ib., I. 89.

Separate planning of improvements within and without the Administrative County.

The production of a general plan of London improvements would thus involve two distinct operations—namely, the planning by the London County Council of improvements within the Administrative County, designed to be carried out over a long series of years; and the preparation, by an independent body, of a plan of through communication between London and the surrounding country, so conceived as to make provision for the needs of the future, after full enquiry and consultation with all the County Councils and other Local Authorities concerned. It would of course be necessary that the two should be brought into relation with each other, but this might be left to the last, and attention directed in the first instance to the separate preparation of the two plans.

Statutory powers for carrying out improvements.

The Royal Commission expressed the opinion that "as land comes into use for building in any part of Greater London, provision should be made for an adequate width of new streets, and that the necessary powers should be given by Act of Parliament." It might be part of the duty of the two bodies charged

with the preparation of a general plan to make suggestions on this point, and to consider what statutory powers would be required, on whom such powers should be conferred, and generally what legislative sanction would be necessary to give effect to their proposals. They might also consider the financial question and suggest how the cost of the scheme could be met, and on whom the burden of providing it should fall.

Importance of Arterial Roads.

Increased use of the roads in recent years.

Of all the changes that have taken place in regard to London traffic since the Royal Commission concluded their labours, none is more remarkable than the increased use of the roads leading into the country. It was indeed foreshadowed in their report, but in 1905 it was not the accomplished fact that it has since become. The increase is almost entirely attributable to the growth of mechanical traffic, and is even more marked in vehicles used for commercial purposes than it is in motor cars of the ordinary type. Motor vans for the delivery of goods have come into general use, and are now employed in considerable numbers by carriers and by large dealers in furniture, provisions, and miscellaneous goods. Many of these vans make daily rounds of sixty miles or more, and serve customers in suburban districts at distances of as much as twenty-five miles from London. The suburban depôts, from which goods were formerly distributed, have been, or are being, given up, and goods are now dispatched direct from the central warehouses to their destinations. Mails are sent by road to places as far distant as Brighton, Dover, Ramsgate, and Ipswich, and new uses for motor vans have lately been found in the conveyance of fruit from the farms to Covent Garden, and in the distribution of parcels.

Commercial motor vehicles.

Growth of mechanical traffic.

Motor traffic of all kinds shows every sign of becoming much larger in volume than it is at present, and new applications of mechanical traction to the conveyance of passengers and goods will almost certainly be found in the near future. Not for this reason alone is the importance of the roads so great. If the radiating roads were wider and more numerous than they are, tramways might be largely extended, and there is no reason except the insufficiency of road accommodation why a large proportion of suburban passenger traffic within eight or ten miles of the centre of London should not be carried by tramway and new districts should not be opened out. The speed which electric tramcars might safely attain on wide roads is little less than the average speed of suburban railway trains, and the cost of tramways is comparatively so small that they could carry passengers profitably at fares which railways could not afford to charge. There is as yet no visible prospect of the supersession of tramways by motor vehicles, but mechanical traction is making rapid progress, and unsuspected developments may easily take place, so that in any case the demand for wide and numerous roads is certain to be great whatever means of locomotion may ultimately prevail.

Wide roads necessary for tramway extension.

Importance of roads in connection with housing.

Moreover the housing problem is inseparably connected with locomotion, and from this, as from every other point of view, the question of the roads is of paramount importance and urgency. Every year that passes makes it more difficult to deal with, and adds to the cost which must ultimately fall upon the community. It is not that road widening and construction on a great scale need be entered upon at once. All that is required for the moment is that the subject should be thoroughly investigated, and measures taken without loss of time to arrest the further growth of new buildings and other obstacles to the construction and widening of roads which will be required in the future. But the requirements must be ascertained before measures can be taken to satisfy them, and the first and indispensable step towards securing this end is an enquiry followed by the preparation of a plan.

Bye-pass Roads.

Congestion of traffic due to narrowness of roads in towns and villages.

In dealing with the roads leading out of London, special attention should be given to the towns and villages in the metropolitan area. They are very numerous, and until comparatively recent times they did not differ in any essential particular from towns and villages in other parts of the country. They are almost invariably situated on the main roads leading out of London,

and probably owe their existence largely to this fact. The growth of London and the increased facility of locomotion have changed the character of these places, and they have now become more or less suburban according to the extent to which they have come under the metropolitan influence. This influence is becoming visible in many directions more than 20 miles from the centre, and is spreading further year by year. It is partly on account of this change that the use of the roads has increased, while in the last three years, since the use of motor vehicles became general, through traffic on the roads has grown very largely. The consequence is that roads which formerly afforded ample accommodation for local purposes and through traffic are now seriously congested where they pass through the towns and villages, causing inconvenience to the inhabitants and delay to traffic. The case of Brentford, on the high road to Bath, to which the Royal Commission call attention, is a notorious, but by no means a solitary, example. In this case the road which traverses the High Street is only 19 feet wide, and as the Commission observe "it is obvious that either an alternative route should be provided, or else that the existing street should be widened." The need for what are called "bye pass roads" to enable traffic to pass round, instead of through, such places is becoming more and more apparent. There are villages such as Eltham, where a "bye pass road" would not only make it unnecessary for through traffic to pass through the village street, but would shorten the road and avoid hills. In preparing a general plan all such places should be carefully examined with a view to laying out an alternative route where the width of the street is insufficient and cannot, as is usually the case, be increased.

Report of R. C., I. 80.

Brentford.

Eltham.

Specific Proposals in regard to Streets and Roads.

Ib., I. 66–82. The Royal Commission refer to a number of specific suggestions for street improvements and other works brought to their notice by the Advisory Board of Engineers. It may be remarked, in passing, that of all these numerous suggestions two only have so far been carried into effect, namely, the widening of Constitution Hill and the improvement at the Marble Arch, and that in both cases the work has been done by or with the assistance of His Majesty's Office of Works.

Suggestions of Advisory Board of Engineers.

Ib., I. 83. In submitting their recommendations the Royal Commission observe that although the improvements suggested by the Advisory Board "probably cover the most striking defects, there are others which have not been specified."

Opinion of the Royal Commission.

Ib., I. 84. They think that all the proposals "are valuable and would produce beneficial results, and that they deserve careful examination by the authorities who may have to deal with the traffic of London, and find the necessary money," but they cannot commit themselves to a final recommendation without fuller investigation than it has been practicable for them to undertake. They add that they are "strongly impressed with the mischiefs arising from the present state of things, and feel that a considerable sacrifice of money would be justified in order to amend it."

Fuller investigation required.

Ib., I. 84. They make three specific recommendations :—

Recommendations of the Royal Commission.

(1) "That so far as practicable, a preference should be given to such street improvements as are indispensable for the development of a complete system of tramways throughout London."

(2) "That in regard to other improvements, those that will relieve the congestion at important places, where traffic crosses in different directions, should be speedily taken in hand."

(3) "That steps should be taken at once for the purpose of preventing the creation of further obstacles to the future widening of existing streets, with proper provision for compensation where legal rights are infringed," and on this point they observe that "some change of the law may be required for this purpose."

Ib., VII., p. 39. Of the numerous suggestions made by the Advisory Board of Engineers, the widening of Euston and Marylebone Roads claims special attention. It would be superfluous to dwell upon the reasons which make it so desirable that these roads should be dealt with without loss of time, because they are fully set out by the Advisory Board, and are further referred to by the Royal Commission. But attention must be drawn to a recent occurrence which bears

Euston and Marylebone Roads.

Ib., I. 75.

directly upon the question of widening. The case is concisely set out by Mr. Riley in the following words (1) :—"An Act of 1756 prohibited the erection of buildings within 50 feet of the highway in Pentonville, Euston and Marylebone roads, which thoroughfares were to be 60 feet wide. This Act has, however, fallen into abeyance, and in many cases the forecourts have been built over and one-storey shops erected thereon. At other places, for a short length, three or four-storied houses have been built so as to contract the width of the thoroughfare to 48 feet from house to house.

"There is little doubt that the Act of 1756 contemplated that these roads would form an important main thoroughfare, and an exceptional opportunity is afforded for the formation of a wide street three miles in length at a comparatively small cost. The Advisory Board of Engineers considered that the principle of the Act of 1756 should be acted upon; that where necessary adjoining properties should be acquired under renewed powers, and that, as a provision for the future, no further building on the forecourts or gardens within 50 feet of the centre should be permitted, compensation being paid for interference with such private rights as may exist. The Commission attached considerable importance to this proposal.

"Repeated attempts have been made to erect buildings on the forecourts abutting on Euston, Marylebone, and Pentonville Roads, and various applications have been made to the Council in respect thereto. On 9th April, 1889, the subject of preventing building encroachments in Euston Road and Marylebone Road was referred by the Council to the Building Act Committee for consideration, and a policy was adopted not to authorise any similar encroachments in these roads. This policy has been followed most consistently.

"In two recent applications for the Council's consent to build in advance of the main line of buildings in Euston Road and Pentonville Road, the Superintending Architect was requested to define the general line, which he indicated to be the line of the main buildings 50 feet from the highway. An appeal was made to the Tribunal of Appeal, who varied the Superintending Architect's certificate by defining the general line to be the line of projecting one-storey buildings. Both cases are still *sub judice*, but if the line defined by the Tribunal is upheld, further obstacles to the scheme suggested by the Commission will be created, as buildings could be erected to a height of 80 feet in place of existing one-storey shops."

Importance of the Euston, Marylebone and Pentonville Roads is increasing.

The importance of the roads in question, which, with the City Road, form a continuous thoroughfare extending from Paddington in the West to Finsbury Square in the East, has increased since the Royal Commission reported.

Though not straight, the line is not so far from direct as to impair its usefulness as a means of communication between West and East for fast vehicles, to which a slight increase in distance is more than made up for by comparative freedom from congestion. Motor traffic is increasing so rapidly that if this thoroughfare were widened it would afford an alternative route to the City from the Bayswater district, which would offer substantial attractions to fast traffic, and would to this extent relieve the crowded central streets. The line of roads, if widened, would fulfil another useful function in connection with the tramway system in the North of London, and one that would be of special value were the radiating roads widened, and the tramways extended. It would serve in some degree the same purpose as the Vienna "Ringstrasse" which partly encircles the ancient City, and affords convenient points of departure for all the tramway lines radiating into the suburbs.

For these reasons, in addition to the reasons given by the Advisory Board of Engineers, it is a matter of supreme importance that advantage should be taken of the capacity for widening which these roads still possess, and that no fresh obstacles should be suffered to grow up to hinder the improvement of a thoroughfare of which the value can hardly be overestimated.

Proposals for widening under the consideration of the London County Council.

The London County Council are now considering a proposal by which the existing forecourts to a depth of 30 feet would be given up by the owners of a section of property on one side of the road in consideration of permission to advance the building line to the extent of 20 feet. If this arrangement is carried out, a partial widening to the extent of half the width of the existing

(1) Appendix C—VII.

roadway will be secured for the public without cost. This would be a considerable gain on the section of the road to which it applies, though the total width of the thoroughfare even here would be less than it might have been made had the Act of 1756 remained in force.

eport of . C., VII., . 41.

Another suggestion to which the Advisory Board attached much importance may be cited as an instance of a lost opportunity to secure a valuable improvement at small cost. Prince's Street, Westminster, leading from Victoria Street to Storey's Gate, has a width at the north end of 27 feet 6 inches, in the centre 53 feet and at the south end 28 feet. The north end is about to be widened to 50 feet in connection with the extension of Government offices. Nothing but a corresponding widening of a short section at the south end was needed to secure the formation of a street 50 feet wide, which would have relieved the neighbouring thoroughfares, and by means of the simple extension contemplated by the Advisory Board, would have given a direct route from Westminster to Regent Street, affording substantial relief to Parliament Street and Whitehall. The land was vacant, and the small strip required for the improvement might have been acquired at a cost which could not have been large. But the opportunity was allowed to slip, and when attention was drawn to the matter early in 1908, and an attempt was made by the Board of Trade to have it reconsidered, it was found that a new building had been commenced, and that it was too late to alter the design.

Prince's Street, Westminster.

Building Laws.

Want of uniformity in Building laws.

The Building laws have a direct bearing on the question of the roads. The Royal Commission point out that while the Building laws applicable to the Administrative County of London are practically uniform, the Building laws locally applicable outside the Administrative County "are either not uniform or are not uniformly applied, and do not," in their opinion, "make sufficient provision for the requirements of the future." They did not think it "necessary to take special evidence in connection with this matter, as it is one that can only be dealt with satisfactorily after separate and careful inquiry." After referring to the want of sufficient provision for through communication by means of main roads, they recommend that the "Building laws and bye-laws made thereunder in Greater London outside the Administrative County of London should, as far as practicable, be made uniform; that the power to define frontages should be given to all Local Authorities; and that new streets or roads should not be taken over by the Local Authorities until sufficient provision has been made for main roads." Where "an undue proportion of the land devoted to buildings would be required for the construction or improvement of main roads," they suggest that "a fixed percentage of the land proposed to be built upon might be set aside for new streets without payment of compensation, additional land, if required, being paid for at its market value." In case of dispute, they recommend that an appeal should lie to the proposed Traffic Board, whose decision should be final.

Ib., I. 86.

Ib., I. 87.

Suggestions with a view to secure adequate width of new roads.

Need for inquiry into working of the Building laws with a view to amendment.

The inquiry recommended by the Royal Commission might be extended with advantage so as to include the working of the existing Building laws, which may be found to require amendment. Mr. Riley, (1) in referring to the powers of the London County Council under the London Building Acts, mentions that in 1905 the Council sought to obtain certain additional powers which are already possessed by many provincial authorities. The clauses relating to these powers were, however, dropped in order to allow another part of the Bill to be proceeded with. The question of conferring additional powers upon the Council, especially in relation to the width of streets, the provision of proper communications between adjoining estates, and the definition of building lines is one that appears to require consideration. The Building Act Committee of the London County Council on the 23rd March, 1908, reported in detail on two cases in which the requirements of the Superintending Architect in regard to new streets had been set aside by the Tribunal of Appeal set up by the

(1) Appendix C—VII.

London Buildings Act, 1894. They also mentioned two instances of variations by the Tribunal of building lines defined by the Superintending Architect, one of them being the case of the Euston Road, which has already been mentioned, and they state that in their opinion such decisions "tend to nullify some of the most important principles of the Building Acts." This subject is referred to in the supplementary statement furnished by Mr. W. E. Riley, which will be found in the Appendix. ([1])

Motor Roads.

Two Bills for the construction of new roads for the exclusive use of motor vehicles were submitted to Parliament in the session of 1908. One sought power to acquire land and construct a motor road from Wood Lane, Hammersmith, to Colnbrook. The other sought similar power for a motor road, combined with a tram road, from Glenthorne Road, Hammersmith, to Windsor. In both cases it was proposed to levy tolls. The roads were to be carried over or under existing roads with connections at suitable points, and they were to be fenced like railways. Neither of these Bills made sufficient progress to receive consideration in Committee, and both projects are consequently in abeyance. They were, however, examined by representatives of the Home Office, the Board of Trade, and the Local Government Board, who considered the subject in conference.

The question of making roads, specially reserved for motor vehicles, involves so many new considerations, that should these projects be revived, or similar proposals be made, it would appear to be for Parliament to decide on the expediency of allowing motor roads to be made, and if allowed, to settle the conditions to be imposed upon their promoters. It would be for consideration in the first place whether such a distinction between mechanical and horse traffic as the authorisation of special motor roads would imply, should receive recognition, having regard to the possibility that, in the future, mechanical traffic may be found to predominate over all other kinds of traffic on the roads. Secondly, the effect of such roads on the traffic of London would require particular consideration. Radiating roads for motor traffic would undoubtedly assist the movement of fast vehicles, and would relieve the existing roads, but before allowing them to be made, it would be necessary to ascertain how far they would fit in with a general scheme, whether they would stand in the way of the opening of thoroughfares required for the common use of all kinds of traffic and to what extent they would impede cross movement. This, however, presupposes the existence of a general scheme, and as has already been mentioned, no such scheme has yet been made, or can be made without full and detailed enquiry. The difficulty is one which arises whenever an attempt is made to pronounce upon the merits of any suggested improvement. It is clear that no real progress can be made until some definite plan has been evolved with which detailed proposals can be compared and co-ordinated.

PUBLIC CARRIAGES.

Changes in public carriages.

The great additions that have been made in the course of the last five years to the facilities for locomotion in London by the construction of new railways and the improvement of the tramway system have not, so far, led to any considerable reduction in the number of the old and familiar public conveyances. Changes have, however, taken place in cabs and omnibuses owing to the rapid advance in mechanical traction, and they are progressing swiftly, especially in regard to cabs and tramcars.

([1]) Appendix C—VII.

The following table shows the number of licences issued by the Chief Commissioner of Police in respect of public carriages in the five years 1903–7 :—

Year.	Hackney Carriages.				Stage Carriages.						Total of all vehicles.
		Four-wheeled.			Omnibus.			Tramway cars.			
	Two-wheeled.	Animal.	Mechanical.	Total.	Animal.	Mechanical.	Total.	Animal.	Mechanical.	Total.	
1903 ...	7,499	3,905	1	11,405	3,623	13	3,636	1,143	576	1,719	16,760
1904 ...	7,137	3,920	2	11,059	3,551	31	3,582	928	810	1,738	16,379
1905 ...	6,996	3,935	19	10,920	3,484	241	3,725	786	1,124	1,910	16,585
1906 ...	6,648	3,844	96	10,588	2,964	783	3,747	905	1,396	2,301	16,636
1907 ...	5,952	3,866	723	10,541	2,557	1,205	3,762	404	1,768	2,172	16,475

Vehicles in service.

These figures may not represent the actual number of vehicles in service, as vehicles may be licensed without being in use, and in the event of a change of ownership, the same vehicle may be licensed more than once in the same year. For example in the year 1906, when the London County Council took over the working of the Northern Tramway system, a number of tramcars were licensed twice. But the figures afford a fair indication of the changes that have taken place from year to year, and serve to show how rapidly mechanical traction is replacing horse traction for public vehicles. Comparing the number of licences issued in 1907 and 1903, there is a net decrease of 285 made up as follows :—

Carriages licensed in 1903 and 1907.

Increase.

Mechanical Hackney Carriages	... ...	722
„ Omnibuses	... ...	1,192
„ Tramcars ...	... ...	1,192
		3,106

Decrease.

Horse-drawn 2-wheeled Hackney Carriages	... ...	1,547
„ 4 „ „ „	... ...	39
„ Omnibuses	... ...	1,066
„ Tramcars	... ...	739
		3,391

New public carriages.

The change from horse to mechanical traction is further indicated by the diminishing number of new horse-drawn vehicles. In his report for the year 1906 the Commissioner of Police stated that "only 231 hansom cabs were presented against 383 last year; 148 four-wheeled horse cabs against 262 in 1905, whilst only 7 new horse omnibuses were submitted in 1906, and no new horse-drawn tramcars."

(a.) *Cabs.*

Increase in the number of motor cabs.

The year 1908 is likely to show a further large increase of motor cabs with a corresponding decrease in the number of horse-drawn cabs. The two principal motor cab companies, which have now been amalgamated, expect to have 3,000 in service by the end of the year. In the report quoted above the Commissioner of Police observed "Two-wheeled hackney carriages continue to rapidly decrease, and may be expected to be more rapidly displaced in the near future by motor cabs. Four-wheeled cabs on the other hand do not decrease so rapidly, as they evidently meet a requirement for the conveyance of luggage to and from the several railway stations and for suburban work."

Though the total number of cab licences has diminished to the extent of 864 in the course of the five years, there is no reason to suppose that there has

Carrying capacity of cabs.

been any diminution of the carrying capacity of cabs on the whole. The efficiency of a motor cab in this respect is so much greater than that of a horse cab, that a smaller number can easily do the same amount of work. The work however is not the same, as motor cabs travel far into the suburbs, and into the country beyond the suburban area. London motor cabs are to be seen as far away as Brighton, Maidenhead and Reading, and to a small extent they carry passengers who would otherwise have travelled by railway. They are largely used for attending race meetings at such places as Kempton Park, Sandown, Hurst Park, Lingfield and Windsor. The field of action of motor cabs is, in fact, so much wider than that of horse cabs, that the total number of cabs is not likely to diminish to any great extent. The average distance travelled daily by a motor cab is said to be 71 miles.

Extended range of motor cabs.

Effect on traffic of substitution of motor for horse cabs.

The substitution of mechanical for horse-drawn cabs which is going on cannot fail to be beneficial to traffic. It tends to diminish congestion in two ways—first, because a journey of given length is performed in less time, and consequently with less occupation of the streets, and, secondly, because a motor cab does not "crawl." Moreover, a mechanical cab is shorter than a horse and cab. Three motor cabs occupy no more space on a rank than two horse cabs.

Conditions and prospects of motor cab business.

Motor cabs quickly established themselves in public favour. They have captured a large amount of the old traffic, and have created a new traffic of their own. Proprietors and drivers alike are said to be doing well, but the business may be less profitable when the numbers are so increased that motor cabs compete with each other instead of with the slower horse-drawn cabs, and new competitors enter the field. The bulk of the new motor cabs belong to two large companies, which have recently been amalgamated. The companies have made suitable arrangements for the upkeep and repair of their cabs, and carry on the business on a sufficiently large scale to yield satisfactory results. 820 motor cabs were registered by the London County Council in 1907. They were owned by eight proprietors, two of whom owned 733, while the remaining 87 were divided among six proprietors. The business is one which can be carried on more profitably on a large than on a small scale, as the expenses of maintenance are heavy unless the number of cabs in the same ownership is sufficient to warrant the provision of properly equipped repair shops, which entail large capital expenditure, and an adequate staff of skilled mechanics.

Ownership.

(b.) *Omnibuses.*

Omnibuses increasing in number.

The number of omnibuses so far from showing any diminution has slightly increased, and even in South London, where the development of the tramways has been greatest, omnibuses are still to be seen on the tramway routes. The number of horse omnibuses licensed by the Commissioner of Police in 1907 was 1,066 less than the number licensed in 1903, while the licences for motor omnibuses increased by 1,192. The total number of omnibuses licensed has increased from 3,636 in 1903 to 3,762 in 1907, and their carrying capacity has increased in a still higher proportion owing to the replacement of horse-drawn by mechanical vehicles, which carry more passengers and have longer daily runs. Reduced to a common standard, the comparison between the two years would be fairly represented by the figures 3,643 and 4,365, an increase of nearly 20 per cent.

Growth of omnibus traffic.

Capacity and mileage of motor and horse omnibuses.

The ordinary type of motor omnibus runs on an average 100 miles per day, and has seating accommodation for 34 passengers, while a horse omnibus, which carries 26 passengers, has a daily average run of 65 miles, and requires 12 horses. If both were constantly full, a motor omnibus would carry twice as many passengers as a horse omnibus, but in practice two motors are found to do the work of three horse vehicles.

Introduction of motor omnibuses and increase in numbers

Motor omnibuses were first introduced into London in 1899. They continued to make fitful appearances in varying but small numbers down to the year 1904, when the early vehicles disappeared, and a type was settled upon which promised some degree of permanence. It was not until 1905 that they were put into service in considerable numbers, and since that year they have increased rapidly. The numbers licensed by the Commissioner of Police were 5 in 1899, 4 in 1900, 10 in 1901, 29 in 1902, 13 in 1903, 31 in 1904, 241 in 1905, 783 in 1906, and 1,205 in 1907. The numbers actually in service were

somewhat smaller. In January, 1906, there were 242 in service, in January, 1907, there were 808, and in January, 1908, there were 946. Motor omnibuses met with immediate success, and were largely patronised by the public, who were quick to appreciate their superiority over horse omnibuses, especially in regard to speed. Much money was, however, lost in the earlier years. Omnibuses of inferior make were imported from abroad in considerable numbers, and were worked by people who did not understand the business. Even the larger omnibus companies failed to appreciate the difference between the conditions of working mechanical and horse-drawn vehicles. Insufficient provision was made for the care, repair, and overhaul of the new omnibuses, they were often run at too high a speed and the length of their daily journeys was much too great. They consequently deteriorated rapidly, and the expenses of maintenance and repair soon became very heavy. These initial mistakes have now been largely corrected. The weaker proprietors have given up the business; the omnibuses are in comparatively few, but stronger hands; proper shops have been provided, with the necessary appliances for repair; the vehicles are overhauled at short intervals; and the daily run of each omnibus has been reduced.

Failure of early types.

Causes of failure.

Remedies.

Simultaneously with the introduction of the motor omnibus on a considerable scale, the proprietors lowered the fares—although the advantages of the faster vehicles were sufficient in themselves to attract the public. They were induced to take this step by exaggerated estimates of receipts, coupled with imperfect appreciation of the cost of maintenance and repair, and these causes combined led to considerable financial trouble. The industry has now become established on a more secure foundation, but it is doubtful whether, even now, motor omnibuses work at a profit.

Lowering of fares.

The types of motor omnibuses have not altered materially since 1905, though improvements—especially in machinery—continue to be made, and the newest vehicles show a substantial advance on their predecessors. Some of the earlier omnibuses were not susceptible of improvement, and several hundreds were condemned by the Commissioner of Police, either on account of their excessive noise, or because of their imperfect construction. In 1906, 285 omnibuses were rejected temporarily, in addition to a large number which were not passed because of their failure to come up to the standard of quiet running. Regulations, which formed the subject of enquiry by a Select Committee of the House of Commons, have now been made and are being enforced. A Committee of three, independent of the Inspecting Staff of public carriages, has been appointed to pass or reject vehicles, and the omnibuses since licensed are said by the Commissioner to show marked improvement. He states in his Report for the year 1906, that "the amount of vibration, depending largely on the condition of the road surface, it is not easy to discover a remedy, but it is hoped that one may be found in time." He adds that "a good number of motor omnibuses, chiefly of foreign make, which in running developed serious mechanical defects, have been stopped, and they will not again be permitted to ply as public service vehicles until they are satisfactorily altered, and comply in all respects with existing requirements." Of the condemned omnibuses about one-third are said to have been broken up. The bodies of others have been fitted to new chassis, while the old chassis have been used up for lorries and other classes of vehicles.

Improvements.

Inspection by the Commissioner of Police.

Regulations.

Vibration.

Omnibuses condemned.

The number of motor omnibuses is still increasing slowly owing, it is believed, rather to a smaller number being under repair than to increase in the stock, but there does not appear to be any immediate prospect of considerable additions, leading to the further supersession of the horse omnibuses. The new vehicles which are being delivered probably represent the fulfilment of orders given some time ago. A more rapid advance may be expected to come in time, as mechanical improvements and economies in working continue to be made, and as public impatience with the slow travel of the horse omnibus grows.

Increase in number of motor omnibuses checked.

The motor omnibuses now on the streets are, with comparatively few exceptions, propelled by internal combustion petrol engines. Steam is used to a limited extent and is growing in favour. A steam omnibus is less noisy than a petrol omnibus, it is less susceptible to injury when travelling over bad

Petrol.

Steam.

roads, and is comparatively free from smell. There are said to be mechanical difficulties, but these are being overcome, and improvements are being made which may lead to a more extended employment of steam.

Electricity. Electric omnibuses are in use in small but increasing numbers. They are quiet, free from smell, and have much less vibration than the other forms, so that they are more comfortable as conveyances, and suffer less from wear and tear. They are heavier than petrol or steam omnibuses and their speed is not so great. It is indeed one of their advantages that they cannot be driven at a speed of more than 12 miles per hour. If they can be worked at a profit they ought to succeed, as they are free from the objections which are so conspicuous in some of the older types. Electricity has great advantages over all other kinds of power for public vehicles, and if it could be adopted generally, the well founded objections to mechanical vehicles would disappear.

Objections to motor omnibuses. There have been great complaints of motor omnibuses—mainly on the ground of noise, vibration, and smell. In the course of the year 1906, in which 783 motor omnibuses were licensed, no fewer than 3,752 reports of unfitness for public use were made by the public carriage staff, and of these, 2,036 were on account of undue noise. House property is said to have depreciated in value on the routes of motor omnibuses. Depreciation has undoubtedly taken place in some cases, but it is equally certain that in others the advent of motors has proved a distinct benefit to house owners, and has led to the letting of houses previously untenanted.

Depreciation of property.

Considerations affecting the use of motor omnibuses. The conditions most favourable to the successful working of motor omnibuses are good roads, limitation of speed, and reasonable length of daily run. The jolting caused by uneven road surfaces—especially at high speed—is as detrimental to the delicate machinery as it is disagreeable to the passengers. The limit of 12 miles per hour ought not to be exceeded, even in the interest of the omnibus proprietor himself. A vehicle which weighs $6\frac{1}{4}$ tons cannot travel at high speed on any but a perfect road without injury to itself, entailing ruinous cost for renewals and repairs, and objectionable noise and vibration. If the average daily run exceeds about 100 miles, mischief is apt to occur, since sufficient time will not be left for the cleaning, examination, and repair which a complicated piece of mechanism requires after its day's work. Motor omnibuses cannot be worked to full advantage unless the numbers in the same ownership are sufficiently large to admit of a reserve of spare vehicles being kept for purposes of relief, and to warrant the maintenance of efficient workshops, equipped with all the necessary appliances for repair, suitable garage accommodation, experienced managers, and a staff of skilled mechanics. It follows that the operation of motor omnibuses on a large scale offers the best prospect of success. Evidence that these considerations are meeting with practical recognition is afforded by the fact that, in May, 1906, 448 motor omnibuses in service were owned by 22 proprietors, in May, 1907, 913 were owned by 19 proprietors, and in May, 1908, 1,047 were owned by 14 proprietors. Amalgamations of existing concerns are taking place, and the business is being concentrated in the hands of strong companies.

Roads.

Speed.

Mileage.

Ownership.

Suggested improvements in type of omnibus. Some authorities consider that the prevailing type of motor omnibus might be improved, especially in the matter of size and weight. A smaller vehicle would be less objectionable in regard to noise and vibration, and though it would not carry so many passengers, it might be found to pay better than one of the prevailing size, since its original cost, running expenses, and wear and tear would all be less. A better service, for which the public would be willing to pay, might possibly be provided by adopting lighter vehicles. A new departure in this direction has been taken by the establishment of a service of light single-decked motor omnibuses, specially fitted, and conveying passengers at a uniform fare of 6*d.*; but such a service necessarily appeals to a limited section of the population, and competes with cabs rather than with omnibuses of the ordinary type. It has been started too recently, and on too small a scale, to enable an opinion to be formed as to whether it meets a genuine need, and is likely to prove commercially successful.

Pullman omnibus.

Comparative efficiency of motor and horse omnibus. The motor omnibus competes successfully with the horse omnibus where traffic is dense or the distance is long, but it requires a heavier load to make it pay. It is said that a horse omnibus can be run at a profit with an average load of six to eight passengers as a minimum, whereas a motor omnibus with the

same load would be run at a loss. This consideration has led to many changes of route, and to the removal of motor omnibuses from routes on which horse omnibuses can, but motors cannot, live. The Omnibus Companies watch the traffic closely, and vary their routes with a view to securing the largest number of passengers.

Omnibuses in competition with electric railways.

Oxford Street route.

Some of the most frequented omnibus routes are also served by electric railways. The road from Bayswater to the City, *viâ* Oxford Street and Holborn, is a case in point. When the Central London Railway was opened in 1900, a large number of omnibuses were taken off the route, but they soon returned, and by 1903 there were nearly as many as there had been before. Since 1903, the numbers have largely increased, and their carrying capacity is now 30 per cent. greater than it was five years ago. Simultaneously with this increase the number of passengers carried by the Central London Railway diminished from 45 millions in 1903 to 39 millions in 1907. A table supplied by Mr. Harper, (1) the Statistical Officer of the London County Council, shows that on all sections of the route but one, the number of omnibuses was larger in 1908 than it had been either in 1895 or in 1903, and allowing for the greater efficiency of a motor as compared with a horse omnibus in the accepted proportion of three to two, the increase in carrying capacity is larger than the figures indicate. Reduced to a common standard of efficiency the carrying capacity would be represented by the following figures :—

Section of Route.	Length of Section.	Carrying capacity of Omnibuses per hour both ways during full hours of Service.		
	Miles.	1895.	1903.	1908.
Shepherd's Bush to Notting Hill Gate ...	1	44	50	135
Notting Hill Gate to Marble Arch	1⅝	48	40	115
Marble Arch to Oxford Circus	¾	390	330	367
Oxford Circus to Tottenham Court Road ...	½	296	298	379
Tottenham Court Road to Bank	1⅞	306	298	355
	5¾			

Position and prospects of the motor omnibus industry.

Amalgamation.

Motor omnibus meets a public need.

Although the motor omnibus has become firmly established in London, and the industry has attained to large proportions, it cannot yet be said to have passed wholly out of the experimental stage. It has not been successful financially, and a point has been reached at which further advance has not come clearly into view. Vehicles have been put on without sufficient regard to the requirements of traffic, and fares have been reduced to a point at which little or no profit is being made. This state of things cannot continue, and unless an early remedy is discovered and applied, the industry as a whole may be in difficulties. The amalgamation of existing Omnibus Companies which is being effected will enable superfluous vehicles to be either suppressed or utilised on new routes, and the services to be so rearranged that motor and horse omnibuses can be used for the purpose which each is best fitted to serve without wasteful duplication and overlapping ; while congestion of traffic will be relieved, and some improvement may in consequence be looked for in the average speed. The economy which always attends the working of large undertakings will enable the cheapest possible accommodation to be given to the public, even if the exisiting scale of fares cannot be maintained. Although the future cannot be foreseen, it can hardly be doubted that the mechanical omnibus, whatever motive power and type of vehicle may ultimately be adopted, is destined to become a permanent, and possibly a dominant, factor in London locomotion. The popularity which it has achieved proves that it meets a distinct public need.

Competition of motor and horse omnibuses.

While there is evidently room in London for both motor and horse omnibuses, it is far from certain that they can be worked with advantage in direct competition with each other on the same routes. The governing considerations are density of traffic and speed. Where the traffic is not heavy enough to

(1) Appendix C.—IV.

warrant the establishment of a motor service, the horse omnibus still finds a useful and profitable field. Where the traffic is heavy, the motor omnibus is a much more efficient instrument, and there would appear to be no advantage in maintaining a competing service of a less efficient kind, which so far from adding to the facilities of movement, delays the faster traffic by filling the streets with comparatively slow, and often superfluous, vehicles.

Their respective speeds.

The difference in the average speed of motor and horse omnibuses depends upon the amount of traffic in the streets, since nothing but congestion of traffic prevents a motor omnibus from travelling habitually up to the authorised limit of 12 miles per hour. A Table supplied by Mr. Harper, shows that, on certain selected routes in the central area, the average speeds are 7·3 and 6 miles per hour respectively, while on certain outlying routes they are 9·1 and 6·1. This points to the conclusion that might be expected, namely, that the superiority of the motor omnibus in point of speed can be better developed on outlying than on crowded routes, where the speed of the faster vehicle is limited by the density of traffic. So long as motor and horse omnibuses compete among themselves for the same traffic, so long will they be found mixed up indiscriminately to the detriment of both. If they were brought under common control, they could undoubtedly be worked to greater advantage, by confining the horse omnibus to routes on which the volume of traffic is too small to support a motor service, and leaving the busier routes to be served by motors. The allocation of routes would have to be varied continually to meet the ever varying requirements of traffic, and to adapt the service to the public needs.

Advantages of common control.

Use of omnibuses as compared with railways and tramways.

Omnibuses serve a purpose for which neither railways or tramways are equally well fitted. They are better adapted than railways for carrying people short distances and they can be used in streets which are too narrow, or are otherwise unsuitable for tramways. Opinions differ as to the relative amount of obstruction caused by tramcars and omnibuses, and as to their relative advantages, but it is beyond question that the omnibus, though its carrying capacity is smaller, has greater flexibility ; and this is a quality of special value in London, since in cases of emergency, such as the closing of a street on account of fire, it admits of the diversion of traffic, from one route to another. Tramway lines in a roadway are moreover always objectionable, and the breakdown of a single tramcar, or of any other vehicle on the line, stops the whole service. On the other hand where streets have ample width and the conditions are otherwise favourable, the tramway has no rival for the safe, convenient and cheap transport of large numbers of people.

Relative obstruction caused by omnibuses and tramcars.

Diversion of traffic.

Tramways unrivalled in favourable conditions.

Relative applicability of tramways and omnibuses to different routes.

It is generally considered that where there is traffic enough to support a service of motor omnibuses running at intervals of 12 minutes, a tramway will pay. The motor omnibus can thus be used to test the traffic of a new route or to develop it up to a point at which it becomes profitable to substitute a tramway. A similar criterion applied to horse omnibus routes would serve to show whether a motor omnibus service might not be substituted with advantage. If such tests were applied systematically, it would be possible to adapt the service to the requirements, and to make the best use of the different kinds of vehicles.

(*c*) *Tramcars.*

Numbers.

The number of tramcars licensed by the Commissioner of Police increased from 1,719 in 1903 to 2,172 in 1907. In this period the number of licences for horse tramcars diminished by 739, while those for electric cars increased by 1,192. Horse cars are being superseded by electric cars, and will disappear when the reconstruction of the tramway system has been completed, as it is expected to be in 1913. The horse tramcars commonly used in London carry on an average 42 passengers and each car requires 12 horses. The latest type of double decked electric tramcars adopted by the London County Council has accommodation for 78 passengers ; some of the earlier types have accommodation for 56, 66, and 72 passengers respectively. The Council have a number of single decked cars for use on the through route from north to south, as the subway will not admit of the passage of double decked cars. The single decked cars have seating room for 36 passengers.

Supersession of horse by electric tramcars.

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The average daily mileage of an electric car is approximately 100, and the average daily mileage of a horse car is approximately 70. *Mileage.*

The speed at which tramcars are allowed to run is limited by the Board of Trade, who authorise maximum speeds for different sections; but although every effort is made to keep the motormen from exceeding these speeds, it is believed that the authorised maxima are not infrequently exceeded. The highest authorised speed in London is 16 miles per hour. *Speed.*

Trailing cars, so frequently seen in foreign towns, have not hitherto been permitted in London. The Board of Trade have given permission for an experimental service of six cars, subject to the Council being able to satisfy the police authorities as to the manner in which these cars would be worked. *Trailers.*

Passengers in excess of the seating accommodation are not allowed in the cars of the London County Council. The Metropolitan Electric Tramways Company obtained statutory power in 1905 to regulate by byelaw the number of passengers to be carried in their cars; and the Board of Trade allowed the company's code, permitting a limited number of excess passengers inside. In the case of the Croydon Corporation the Board did not disallow a byelaw under which the conductor might permit a limited number of passengers to travel standing inside the cars. As far as the Board of Trade are aware, these are the only instances in which excess passengers are allowed within the area of Greater London. *Excess passengers.*

TRAMWAYS.

Summary of the conclusions and Recommendations of the Royal Commission.

In Chapter VI of their Report, the Royal Commission discuss the whole subject of Tramways in detail and make their recommendations.

Report of R. C., I. 91. Under the head of "Limited Extent of London Tramway System" they lay it down that wherever tramways "can be laid on existing streets without widening, they can be made, if worked commercially, a direct source of profit—the wider and more connected the system, the greater in all probability would be the profit." *Tramways a source of profit.*

Ib., I. 92. At the end of 1904 the route mileage of Tramways in Greater London was 203 miles and 26 chains working, and 146 miles and 68 chains authorised but not working. The figures compare very unfavourably with those of other towns in England and Scotland. *Mileage of tramways in Greater London.*

Ib., I. 93. Under the head of "Want of Through Communication by Tramway" the Royal Commission state that "within the County of London nearly the whole of the tramways are owned, and in great part are worked, by the London County Council, whose policy has been consistently directed to the exclusion of private promoters." In the districts of Greater London lying outside the Administrative County, the tramways are largely worked by private Companies. This difference of policy, though it need not necessarily entail inconvenience, does in point of fact cause interruption at the boundary owing to want of through running, and sometimes of physical connection. *Policy of the London County Council. Policy in adjoining counties.*

Ib., I. 94. They mention very serious defects inside the Administrative County itself. "Three systems of tramways are included in this area; the northern and eastern system wholly north of the Thames; the western system also wholly north of the Thames; and the southern system wholly south of the Thames"; all "separated from each other by long intervals without any connection"; while great districts in the centre of London are entirely unprovided with Tramway service. "The different lines approach those districts and break off abruptly in the middle of the street." The result is that cars discharge their passengers at dead end terminals causing inconvenience to the passengers themselves, and congestion both of tramcars and of ordinary vehicular and pedestrian traffic, while the carrying power of the tramways is diminished by an amount, *Ib.*, I. 95. estimated by the Advisory Board of Engineers at one half, by reason of the cross shunting at the terminals. *Three separate systems.*

Uses of tramways.

Under the head of "Advantages and Cost of Street Tramways" the Royal Commission proceed to consider "what kind of facilities tramways afford; what is their comparative cost; and what difficulties stand in the way of their extension in a City like London." In cities of less size and population tramways carry passengers from one part to another and also between the city and adjoining areas to a distance of 8 or 10 miles. In London, the Royal Commission think, they will be chiefly used for short distances in urban and suburban districts, though they may prove valuable auxiliaries for conveying passengers on longer journeys also. They compare the relative advantages of tramways and railways in point of speed, cheapness, and convenience, and conclude that, while a frequent tramway service at moderate fares would be largely used in preference to a railway service for comparatively short journeys, preference would generally be given to railways for longer distances.

Report of R. C., I. 97.

Short distance traffic.

Relative advantages of tramways and railways.

Combined working of railways and tramways.

The Royal Commission are of opinion that "railways and tramways can with advantage be worked so as to supplement each other and provide a comprehensive system of locomotion." They suggest that tube railways instead of ending at a dead end terminal underground, "might be prolonged till they reach the surface in the more open country, and then be continued on the surface as railways or tramways to, or beyond, the suburbs radiating in different directions." Tramways in urban and suburban districts should also be laid out in interchange connection with railways. Railways are not likely to compete successfully with tramways for traffic in crowded streets.

Ib., I. 98.

Supersession of omnibuses by tramways.

The Royal Commission do not think that omnibuses can compete with an efficient system of tramways, though they may serve a useful purpose where tramways do not penetrate. They believe that where there is fair competition there will be a repetition of the experience of Liverpool where "within a period of seven years all the omnibuses disappeared from the streets, and gave place to electric tramcars, while the number of passengers carried was nearly trebled."

Ib., I. 99.

Motor omnibuses.

Referring to motor omnibuses, then beginning to appear, the Royal Commission, while recognising that they may supersede horse omnibuses, think that "on routes suitable for tramways where there is a large traffic, tramways will continue to be the most efficient and the cheapest means of street conveyance." They "cannot recommend the postponement of tramway extension in London on the ground of any visible prospect of the supersession of tramways by motor omnibuses."

Ib., I. 100.

Comparative cost of railways and tramways.

Dealing with the cost of tramways as compared with that of underground railways, the Royal Commission observe that the cheapest system of railway construction might, in the opinion of the Advisory Board of Engineers, cost from £250,000 to £300,000 per mile if stations were few in number, land obtained free of cost, and exceptional facilities granted for the work; while the cost of double lines of tramways is stated by the London County Council to be £39,512 for overhead construction, and £52,602 for conduit construction. (1) These figures include nothing for street widening. They state that "the opinion is widely held that the streets of London are too narrow for tramways on a great scale. No doubt many streets are too narrow. The real question is whether this disadvantage is so widespread as to necessitate the postponement of a great tramway extension until costly operations of widening have been carried through." They add that the Advisory Board of Engineers do not make any definite recommendations as to the minimum width of streets in which tramways would be admissible. On some important routes "they consider that a width of 48 feet between the kerbs or 80 feet from house to house is necessary, and they think that a width of 100 feet from house to house should be ultimately provided." On streets with a width of 60 feet, where the traffic would not be so heavy, the Advisory Board of Engineers contemplate the construction of two tramway tracks, while the London County Council aim at a minimum width of 33 feet between the kerbs. The Royal Commission "think that a greater width than 33 feet is desirable as a rule for a double line of tramway, but that for short distances, or in less frequented thoroughfares even a less width may be accepted," and that single lines might be laid in still narrower streets. "Judged by the

Ib., I. 101.

Ib., VII. p. 113.

Width of streets in relation to tramways.

Ib., VII. pp. 33 and 45.

Ib., I. 102.

(1) The figures include a proportion of the cost of power stations and general charges. They also include the cost of cars. The actual cost of track construction is much less.

above standards of width many of the main thoroughfares of London will admit of tramways. Of course the decision must depend partly upon the extent to which the street is crowded, as well as upon its width. Certainly some street improvement is necessary in places from any point of view, and we have already recommended that preference should be given, as far as possible, to improvements which would widen roads intended for tramways, but we are persuaded that a great deal can be done in the way of tramway extension, without any great expense of this kind."

Preference should be given to widening streets intended for tramways.

Report of R.C., I. 103. *Ib.*, I. 104.

Tramways recommended by Advisory Board of Engineers.

Under the head of "Tramways recommended by Advisory Board of Engineers," the Royal Commission describe and criticise twenty-three specific proposals for new tramways which they set out in detail. Referring to the effect of these proposals they point out that "urgently needed through communication would be afforded. In short the three isolated systems which we have described, would be linked together; the central area, hitherto destitute of tramways, would be partially opened out, and the Thames would no longer interrupt communication between north and south."

Ib., I. 105.

Tramway subways.

The Royal Commission admit that some of the proposals on which the Advisory Board report, involving as they do a large extent of subways, are open to criticism. The cost of subways is put by some as high as a million in specific localities, by others as low as £300,000 per mile where more favourable conditions exist. At the lowest estimate tramways, so far from being remunerative, might prove a source of heavy loss, and where so much is needed in the way of improvements, one governing consideration must of necessity be finance. They "do not say that subways ought in no case to be constructed," but "for the most part, if the choice lies between subways and widening, we believe that it will be found nearly as cheap to widen the streets and lay tramways on the surface. In any case it must be a question of relative cost, with the additional consideration that travelling on the surface is always preferable, and a wide street always has an advantage."

Ib., I. 107.

Tramways in the City of London.

The position of the City of London is peculiar. In no district of London is the congestion greater or relief more urgently needed; the streets in the more crowded parts are not wide enough to admit of surface tramways, having regard to the traffic; and widening is impracticable because of the value of land. The Corporation "have uniformly opposed the laying of any surface tramways within their precincts, though they do not object to subways." "If they adhere to this view," say the Royal Commission, "and no surface tramways are allowed in any part of the City, the cost of subways would, on so great a scale as to satisfy existing requirements, be prohibitive. Either they would not be constructed, and the evil left without a remedy, or other parts of London would have to suffer. We think that surface tramways should be laid down in the City of London where they can be shown to be reasonably practicable, and that subways should be made where surface tramways are not practicable."

Tramway proposals specially commended.

The Royal Commission select some of the tramway proposals of the Advisory Board for special commendation. Such are:

Ib., I. 108.

Blackfriar's Bridge and Farringdon Street.

(1) The suggested line upon Blackfriars Bridge, proceeding thence along a raised viaduct to Farringdon Street, and joining the London County Council's tramways at Theobald's Road.

Ib., I. 109.

Victoria and Marble Arch.

(2) A suggested tramway connection between Victoria and the Marble Arch. The Advisory Board propose a subway, for the construction of which the route offers unusual facilities. The Royal Commission attach so much importance to this connection that they think "it should be taken in hand with as little delay as possible." "If public opinion," they add, "would tolerate tramways on the surface along the eastern edge of Hyde Park, and thence down Grosvenor Place, the cost would not, it is believed, exceed £80,000 in all, but the congestion at the crossings would not be relieved."

Ib., I. 110.

Tramways recommended on five specified routes.

(3) With regard to five other specified suggestions of the Advisory Board, the Royal Commission express their belief "that most of these routes could be laid out for tramways with only a moderate outlay for widening in particular places, and we are so convinced of the urgent necessity for tramway accommodation in London, that we recommend that the work on the five routes in question should be taken in hand as soon as possible." The five routes are the Euston and Marylebone Roads, Bayswater Road, Hammersmith Road, Fulham Road, and King's Road, Chelsea.

Extensions and through running recommended.

Under the head of "Recommendations (a) Tramways" the Royal Commission summarise their conclusions, and recommend "a large extension of tramways in London and the suburbs; that immediate attention be given to providing through communication between the different tramway systems within the Administrative County of London; across the Thames by Westminster and Blackfriars Bridges; and that provision be made for through running inside and outside the Administrative County of London." Report of R. C. I. 111.

Running powers, through running, and through booking.

They point out that any great increase of tramways "would lead to the necessity of organization for the purpose of securing the harmonious working of the separately owned systems." They lay special stress upon through running of cars over systems separately owned, and the necessity for stringent regulations for facilitating traffic. They rely on the action of the proposed Traffic Board to protect the interests of the public, and think that the Board should insist on through communication, enforcing their demand, if necessary, by the grant of running powers subject to approval by Parliament. Where through running is impracticable, through bookings and convenient interchange should be secured. *Ib.*, I. 112.

Municipal working of tramways.

While they think it reasonable that some profit should be derived from the tramways for the benefit of the municipality, it does not follow that the greatest advantage will be gained by the task of operating being undertaken by the municipality. In other countries, where the working of municipally owned tramways is left to operating companies, it is claimed that such methods yield better financial results to municipalities, and avoid difficulties. If the operating company also undertake the construction, by contract with the municipal authorities, the latter are "saved from the risks and disadvantages attendant upon the making, as well as the working of a line by a municipality." They further express the opinion that if tramways are worked by municipalities "they should be worked on sound financial principles, with ample provision for depreciation and repayment of capital or discharge of debt;" and they think that any profit "should preferentially be applied to necessary tramway developments and to street improvements."

Procedure for obtaining authority to construct tramways.

Under the head of "(b) Procedure for obtaining authority to construct Tramways, and Question of the Veto" the Royal Commission proceed to consider whether any change is necessary in the law. They describe the four methods by which construction may be authorized, namely, under the Railway Construction Facilities Act, 1864, the Tramways Act, 1870, the Light Railways Act, 1896, and the procedure by Private Bill, and they state that "the only two methods practically available for procuring legislative authority to build tramways in London are subject to veto by the local and road authorities." Within the Administrative County, the London County Council, the Metropolitan Borough Councils, and the Corporation of the City, all possess a right of veto, and have used it frequently. Outside the county the road authorities, the local authorities, and the frontagers in certain cases, also have a right of veto. The evidence laid before them leads, they say, "to the conclusion that the veto has been used in many cases without due regard to the interest of the general public." *Ib.*, I. 113. *Ib.*, I. 114.

Views of municipal authorities and others on the abolition of the veto.

Promoters of tramways are opposed to the maintenance of the veto, while the authorities who possess the veto are generally opposed to its abolition, but are not quite unanimous. The City Corporation are strongly opposed to abolition. The London County Council would like to see the veto of the Corporation and of the Borough Councils abolished, while retaining its own. Independent witnesses, such as the Speaker of the House of Commons, and the Counsel to the Chairman of Committees of the House of Lords, favour the abolition of the veto, which, in their opinion, has worked a great deal of mischief, and has been extremely detrimental to tramway enterprise, and bad for the municipal bodies themselves.

Royal Commission recommend abolition.

The Royal Commission find that tramway development has been seriously checked by the operation of the veto, which is sometimes exercised without due regard to the importance of establishing through tramway communication. They come to the conclusion "that the best course is to abolish the veto in all cases, but to provide that in Greater London, the County Council, and the Corporation of the City of London shall have a preferential right to construct any tramways within their districts if they are prepared to do so." *Ib.*, I. 115.

They think it "sufficient that local and road authorities should have a *locus standi* to appear before the proposed Traffic Board and Parliament in opposition to any tramway scheme within their districts by whomsoever such tramway scheme might be promoted." They also recommend that the frontager's veto should be abolished, and that those who now possess it should have a *locus standi* upon any tramway scheme affecting their property.

Mileage of Tramways and progress of Tramway Extension and Reconstruction in Greater London between 1903 *and* 1907.

Mileage of tramways in Greater London.

The mileage of tramway lines open for traffic and the number of passengers carried by tramway in Greater London for the five years 1903 to 1907 are given in the following Table :—

MILEAGE OF TRAMWAY LINES AND TRAMWAY PASSENGER TRAFFIC IN GREATER LONDON.

Year.	Length of line open.						Passengers carried.		
	Within the County of London.		In outer London.		In Greater London.		Within the County of London.	In outer London.	In Greater London.
	Route miles.	Single track miles.	Route miles.	Single track miles.	Route miles.	Single track miles.			
1903 ...	115·18	205·92	73·74	121·55	188·92	327·47	299,209,364	95,147,167	394,356,531
1904 ...	119·35	213·08	103·66	177·77	223·01	390·85	311,691,157	120,122,682	431,813,839
1905 ...	117·73	213·66	131·37	220·33	249·10	433·99	324,854,380	153,090,304	477,944,684
1906 ...	117·59	219·04	169·31	303·51	286·90	522·55	316,986,310(a)	191,713,959	508,700,269
1907 ...	126·80	234·12	177·13	319·51	303·93	553·63	373,525,754(b)	212,169,531(b)	585,695,285(b)

(a) **Falling off due to dislocation of traffic during electrification of London County Council northern tramways.**

(b) **The passenger figures for 1907 are approximate only.**

(a) *Administrative County.*

Mileage of tramways in the administrative county.

The total length of tramways in the Administrative County at the end of 1907 was 126·8 route or street miles. Of this length all but 11 miles belonged to the London County Council.

Tramways owned by the London County Council.

The Council's Tramways consist of lines purchased from various Companies, and new lines constructed by the Council itself. Since the end of 1902 the Council have acquired $20\frac{1}{4}$ miles of existing tramways, of which $2\frac{7}{8}$ have been abandoned, and they have constructed $15\frac{1}{8}$ miles of new lines. The 11 miles of tramways in the County, still belonging to other authorities and Companies, are all purchasable by the Council at various dates, and in some cases negotiations for purchase, either compulsorily or by agreement, are proceeding. These lines are parts of tramway systems outside the County.

Reconstruction of horse tramways for electrical traction.

The progress of the Council's tramways is not to be measured by mileage alone. Up to the year 1902, the whole of the tramways owned by the Council were worked by horse power. In that year the work of reconstruction for electrical traction was taken in hand, and it has progressed steadily from that time onwards with a corresponding diminution of the horse tramway mileage. At the end of 1907, $68\frac{5}{8}$ miles were worked electrically. The remainder were horse tramways, and of these, $7\frac{1}{8}$ miles were in course of reconstruction. In addition, the Council had power to construct 14 miles of additional line, of which $4\frac{1}{8}$ miles were about to be taken in hand.

Progress of reconstruction.

The first of the newly electrified tramways, namely, the line from Tooting to the termini at or near Westminster, Waterloo, and Blackfriars Bridges was opened for public traffic on the 15th May, 1903, and up to the end of 1906 the

work of reconstructing and electrifying the old horse lines, and constructing new electrical tramways was mainly confined to the South side of the Thames. Since 1906, when the lease of the Northern tramways to the North Metropolitan Tramways Company came to an end, the work has made rapid progress on both sides of the Thames. New tramways crossing Vauxhall and Westminster Bridges were opened in August, 1906, and December, 1906, respectively. Many of the old lines, which were formerly of narrow gauges, have been reconstructed to the standard gauge, and the whole system is becoming rapidly unified in this respect.

Systems of working overhead and conduit.

G.B. surface contact system.

Two systems of working have hitherto been in use, known respectively as the overhead trolley system and the conduit system. The former has been adopted in the outlying districts, and the latter in the more central parts. A third, known as the G.B. surface contact system, has lately been installed experimentally on the Bow Road. The introduction of a third system, though undesirable, became necessary owing, it is said, to the refusal of the Stepney Borough Council to consent to overhead traction on this route, and to the impossibility of using the conduit system, due to the existence of a railway tunnel under the roadway. The total length of single track on this system is stated by Mr. Fell, Chief Officer of Tramways of the London County Council, to be approximately five miles, and the estimated average cost of construction to be £8,500 per mile of single track. (1) So far the experiment has not been successful; there have been several accidents, the service of electric cars has been stopped, and the line is being worked with horse cars.

Experimental working has not been successful.

Northern tramways.

The Council's tramways north of the Thames, with a route mileage of about 48½ miles, were leased to the North Metropolitan Tramways Company till the 1st April, 1906. Since that date the Council have worked practically the whole of their own tramways. It is their settled policy to acquire and work all tramways within the Administrative County of London.

Subway between Southhampton Row and Victoria Embankment.

All the Council's tramways are on the surface, with the exception of a short length carried in subway between Southampton Row and Victoria Embankment. Part of the subway, 2,920 feet in length, between Southampton Row and the North side of the Strand, was constructed simultaneously with the formation of the new street (Kingsway) under which it passes. This portion was opened for traffic, as far as Aldwych, in February, 1906, and the cost of construction is stated by Mr. Fitzmaurice, the Engineer of the London County Council, who designed and superintended the execution of the whole of the work, to have been £133,500. The remaining portion of the subway between the Strand and Victoria Embankment, 620 feet in length, was opened for traffic in April, 1908, and its cost is estimated at £96,000, including property. This was a work of considerable difficulty, and was carried out with complete success. The completion of the subway is of great importance, inasmuch as it establishes communication for the first time between the Tramway systems North and South of the Thames.

Progress in linking up detached tramways.

Since the Royal Commission reported (1) considerable progress has been made in the work of linking up existing tramways and abolishing dead end terminals. The extension of the tramway across Westminster Bridge has done away with the terminal in Westminster Bridge Road; the tramway over Vauxhall Bridge has abolished two terminals, and has brought an isolated line north of the Thames into connection with the extensive system south of the Thames; and the continuation of the subway has abolished the underground terminal in Aldwych. Further, when the widening of Blackfriars Bridge, now in progress, shall have been completed by the Corporation of the City of London, and a tramway laid on the widened portion, there will be a third tramway route across the Thames; and the line, which will be worked by the County Council as part of its system, will connect two existing lines which now stop at dead ends.

Extensions of L.C.C. tramways.

The lines of the County Council have been extended in various directions to meet systems outside the County, but they have not always been physically connected, and no arrangements have been made for through running.

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(1) The comparative cost of constructing tramways on the three systems cannot be given exactly because it varies greatly in different localities. It has been put at £17,000 per mile of single track for the Conduit system, £10,500 for the surface contact system, and £9,500 for the Trolley system, but the figures can only be regarded as rough averages.

(2) 26th June, 1905.

Improvements in last five years.

The improvements made in the course of the last five years have thus comprised the purchase by the County Council of separate lines worked independently, their reconstruction for electrical working, their extension in various directions, and the linking up of disjointed systems as far as has yet been practicable.

Increase in tramway passenger traffic.

The number of passengers carried by tramway in the County of London have, as shown by a table given above, increased from 299,209,364 in 1903–4 to 373,525,754 in 1907–8([1])—an increase of 25 per cent. in five years. Mr. Fell states that the tramways have not been working up to their full capacity, as the whole system has been, and is still, greatly disorganised by the reconstruction, now in progress, of the horse tramways for electrical traction.

Example of increase due to electrification.

As an illustration of the effect of substituting electric for horse traction, Mr. Fell has given a comparative statement([2]) of the number of passengers carried on the Stamford Hill route, which was opened for electric traction on 6th February, 1907. These numbers were :—

By horse cars	for the month of	April,	1906 ...	... 1,300,488
„ electric	„	„	1907 ...	... 1,753,512
„ „	„	„	Sept. 1907 ...	... 2,348,441

He has also furnished the following statement of the number of workmen carried on the Council's tramways in the last four years :—

1904–5.	1905–6.	1906–7.	1907–8.
9,898,289	13,011,473	19,528,799	27,977,412

Increase in number of workmen carried by tramway.

Taking the Tooting route as an example he states that the number of workmen carried increased from 581,626 in 1902–3 to 3,342,277 in 1906–7 and he attributes this enormous increase to the improved accommodation and increased speeds which make it possible for workmen to live at a considerable distance away from their work.

(*b.*) *Outer London.*

Changes in the tramway systems of Outer London.

The changes that have taken place in the tramway systems in Outer London in the course of the last 5 years, though no less extensive than those made within the Administrative County, have been of a different kind. In the County of London the changes have consisted mainly in the reconstruction of horse tramways for electrical working without much addition to mileage, whereas in Outer London they have consisted mainly in extensions of previously existing electric lines Very little horse tramway mileage remains to be converted.

Increase of mileage.

The total route mileage of tramways in Outer London has increased from 73·74 miles in 1903 to 177·13 in 1907—an increase of 140 per cent., while the track mileage has increased in the same time from 121·55 to 319·51—an increase of 163 per cent.

London United Tramways Company.

The largest of the systems is that of the London United Tramways Company, who own and work 55·32 route miles, of which 5·4 are within the County, in the west and south-west suburban districts. The company have powers to make extensions amounting to 18·77 route miles, but it is doubtful whether they will be largely exercised. They have now obtained power to reconstruct their only remaining horse tramway, between Richmond and Kew, for electrical traction, and to connect it with the rest of their system by a short new line crossing Kew Bridge.[3]

([1]) See *Ante*, p. 31.
([2]) Appendix C.—III.
([3]) Bill received the Royal Assent 1st August, 1908.

Metropolitan Electric Tramway Company.

The next largest is that of the Metropolitan Electric Tramways Company, who work 41 route miles of tramways and light railways in the Northern suburban district, part of which they own, while the bulk of the remainder is leased to them by the County Council of Middlesex, and a small portion by the County Council of Hertfordshire. Extensions to the extent of 17 route miles are authorised, and of these four miles are under construction, and will be worked by the company. The tramways owned by the company are purchasable by the local authorities.

South Metropolitan Tramways Company.

The South Metropolitan Tramways Company own and work 13 route miles of tramways in the neighbourhood of Croydon. They have powers to construct 5·65 additional route miles, but do not propose to exercise them. Their lines are in physical connection with the lines of the Croydon Corporation with whom they have mutual running powers.

The remaining tramway systems are owned and worked by local authorities.

(*c.*) *Greater London.*

Mileage of tramways at end of 1907, and estimated mileage at end of 1908.

The mileages of all the tramway systems of Greater London as they stood at the end of the year 1907, and the mileages as they are estimated to stand at the end of 1908 are given in Appendix A—v.

Progress since 1904.

The Royal Commission stated that at the end of 1904, there were 203·32 route miles of tramways working in Greater London, and 146·85 miles authorised but not yet working. At the end of 1907 the total route mileage of tramways and light railways open for traffic in Greater London was 303·93 miles, and the total length of single track was 553·63 miles.(1) 15·48 route miles and 29·95 track miles of new electric tramways were under construction, a much larger amount was authorised, and it was estimated that by the end of 1908, the total route mileage would be 331·87 and the total track mileage 614·97. These figures do not measure the whole of the progress which has been made, since many miles of horse tramways have been reconstructed for electric traction. At the end of 1907 there were still 51·62 route miles of horse tramways, almost all owned by the London County Council. It is anticipated that by the end of the year 1908, the route mileage of horse tramways will be reduced to 45·72, with a corresponding addition to the electric mileage. The conversion is expected to be completed by the year 1913.

Report of R. C. I. 92.

Defects of the existing Tramway System and need for further enquiry with a view to their removal.

Insufficiency of tramways in London.

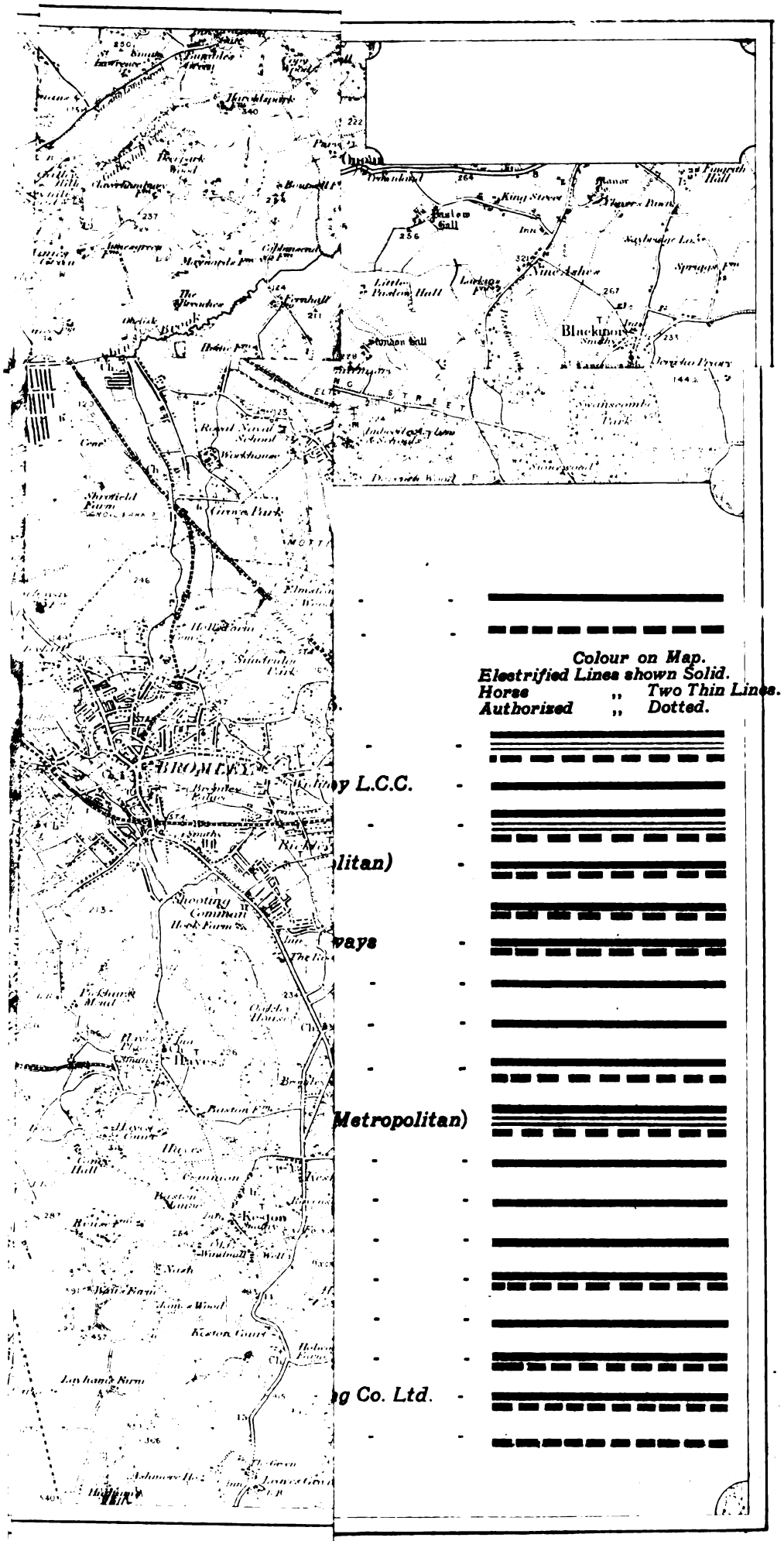
It will be seen by reference to the map that the tramways of Greater London cover an extensive area and ramify in many directions; but large as the aggregate mileage is, it is far smaller in proportion to population than the mileage of tramways in provincial cities, and compares even more unfavourably with the tramway mileage in populous centres in foreign countries.

Other defects. Diversity in ownership and working arrangements. Want of connection, through running, and through booking.

Insufficiency of mileage, as pointed out by the Royal Commission, is not the only defect of the tramway service. There is much diversity in ownership and in working. Within the County of London nearly the whole of the tramways are owned and worked by the London County Council, while in the districts lying outside the Administrative County some of the tramways are worked by companies which own the lines, others are owned by local authorities and worked by companies, and the remainder are owned and worked by local authorities. There is little harmony in the working of these different systems, even when they are physically connected, and with rare exceptions no arrangements have been made for through running or even for through booking. The change of cars at the boundaries between the systems is

***Ib.*, I. 93.**

(1) These figures do not include the Highgate Hill tramway worked by cable, of which the route and track mileages are ·71 and 1·31 respectively.



d Printed at the Ordnance Survey Office Southampton. 1908

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inconvenient to through passengers, and even more to local passengers who wish to cross the border. The sum of two local fares is always greater than a single through fare, and many people walk to a boundary in order to avoid paying the fare of a whole stage for a short journey. The result is that comparatively few of those who would willingly use the tramway are taken up for considerable distances on either side of a boundary, and an interval of inefficient service separates each pair of systems.

Strictures of the Royal Commission.

Report of R. C. I. 96. The Royal Commission make severe comments upon the many inconveniences arising out of the conditions of the tramway service. "From every point of view," they say, "tramway accommodation is glaringly defective." Again "it is difficult to appreciate how such a state of things can have been tolerated so long. Whatever view may be held upon the expediency of extending tramways in London, it cannot be expedient to work those we have upon inefficient methods." Though the tramway system has been much improved since these observations were made, they are not wholly inapplicable now.

Extent to which tramways are admissible.

Ib., I. 101 and 102. The Royal Commission have dealt so fully with the relative advantages of tramways and railways, with the cost of construction, and with the all important question of street widening in this connection, that it would be unprofitable to go over the ground again, since little or no fresh experience has been gained in regard to these matters.

Minimum width of streets.

No standard minimum of width of streets in which tramways would be admissible could be laid down, because so much depends upon the volume of traffic, the frequency of the tramway service, and whether the streets are used for business or for residential purposes. Each case must be dealt with on its merits. It may, however, be observed that a width of 48 feet is the least that would admit of a double line of tramway with two lines of traffic on each side, and it follows that tramways ought not to be allowed in any busy street, with shops on both sides, where there will of necessity be many standing vehicles, unless the width between the kerbs is at least 48 feet.

Congestion caused by tramcars.

Tramcars, owing to their great length and their rigid movement on fixed lines undoubtedly cause congestion in narrow streets, especially at crossings, and instances are not wanting in London of streets in which the admission of tramways has been attended with inconvenience, if not with danger. In such streets the speed of tramcars is no greater than that of omnibuses, while their movement is much less flexible, and the breakdown of a single car or any other vehicle on the track blocks the way for all the cars that follow. The inconvenience may be outweighed by the advantages of through communication, but it is sufficient to show the need for caution in allowing tramways to enter narrow streets.

Use of tramways

Ib., I. 97. The Commission believe that the chief use of tramways is for short distance traffic, though "they may prove valuable auxiliaries for conveying passengers on longer journeys also." Experience, they say, "has shown that the Metropolitan Railways, even where no tramways compete, practically do not attract passengers for journeys of less than a mile. We think that if a frequent tramway service can be provided at moderate fares, it would be very largely used in preference to a railway service, for comparatively short journeys. For longer distances, a preference would generally be given to railways, because of their speed." Recent experience shows that the electrification and extension of tramways, especially in the southern and eastern districts, have drawn away a large amount of passenger traffic from the railways, and it can hardly be doubted that a still larger amount would be drawn away were the tramway systems to be further perfected by extensions and connections as the Royal Commission recommend.

as compared with railways.

Range of tramway service.

Ib., I. 111. As it is tramways compete successfully with railways for distances up to five or six miles. If through running were established between the inner and outer systems, and if the roads were widened so as to admit of greater speed, the radius of distribution by tramway might easily extend to eight or even ten miles, and to this extent tramways might become something more than valuable auxiliaries for the conveyance of passenger traffic. Many people prefer a tramway to a railway journey, especially in fine weather, even at some sacrifice of time.

Advantage of combined working of railways and tramways.

The Commission point out that "railways and tramways can with advantage be worked so as to supplement each other, and provide a comprehensive system of locomotion." The only example of this to be seen at present is furnished by the London United Tramways which work in connection with the Metropolitan District and the Great Northern, Piccadilly and Brompton Railways. Although facilities are afforded to passengers in the way of through bookings, the public so far have not taken advantage of them to any great extent, and seem less inclined to book through from a tramway to a railway than from one railway to another. But the principle is one which might have important developments if it were carried further, and people became familiar with the convenience which the system of through booking affords. Report of R. C. I. 98.

Through booking.

Want of connection of tramway system.

One of the main defects of the tramway system of London, as pointed out by the Royal Commission, is that the various sections are disconnected from each other, and that a large area in the centre is unprovided with tramways. The reason is not far to seek. It lies in the physical obstacles which the crowded central thoroughfares present to tramway construction,—obstacles which can only be overcome by adopting one of two costly alternatives,—namely extensive street widening, or the construction of subways. But the central area is traversed by electric railways in many directions, and a glance at the map is sufficient to show that even now they occupy the field fairly well, and furnish to a large extent the very connections which the tramways alone fail to afford. Like the tramways they suffer from the disadvantages of divided ownership, but taken as a whole, they provide means of communication between so many parts of the Metropolitan area, that if worked in combination with the tramways they would go far to meet the needs of public locomotion. It is true, as the Royal Commission say, that "underground railways do not serve altogether the same purpose as tramways," but they might nevertheless work in connection with the latter, and by means of universal through booking and carefully planned interchange stations, the two might be welded into a comprehensive system of Urban communication. The full advantage of such a combination could not, however, be attained without unity of management and control, and on this point the observations of the Commission are significant. *Ib.*, I. 94.

Electric railways in the central area.

Tramways and railways might supplement each other.

Ib., I. 92.

Economical working of large systems.

Referring to a recommendation made by a Select Committee of the House of Lords in 1863 that "every system of internal railway communication for the Metropolis should be under one management for working purposes," the Royal Commission express the opinion that this recommendation carries no less force in the present day than it did at the time it was made. "All large systems of mechanical traction," they say, "can be worked most economically and with the greatest advantage to the public when they are under one and the same management. It is only by extensive amalgamations that the great advantages arising from unity of interest and unity of management can be fully realised. We believe that amalgamation can be carried out in such a way as to be profitable to the shareholders and advantageous to the public, but we think that it should only be sanctioned on terms and conditions which fully secure the interests of the public." They then refer to the controlling power secured by the Underground Electric Railways Company of London over three of the tube railways, and the powerful influence which they exercise over the Metropolitan District Railway Company and the London United Tramways Company, and they express their belief "that the formation of the Company has been of material assistance in raising the capital for works which will be of great public benefit." Though the various undertakings controlled by the Company have not been technically amalgamated, they have been brought under single control with signal advantage to the public, and it can hardly be doubted that an extension of the principle of amalgamation to the whole of the electric railways and tramways of London would be attended with still greater public benefit. It might perhaps eventually be carried a step further so as to include the Metropolitan omnibus services, so that all the public means of locomotion in London, with the exception of the Trunk Railways, and cabs, might be brought into one comprehensive system under single management. *Ib.*, I. 152.

Advantages of amalgamation.

Public interest must be secured.

Benefit resulting from amalgamation of electric railways and tramways.

Referring again to the recommendation of the Select Committee of the House of Lords on Metropolitan Railway Communication, the Royal Commission say that they attach great importance to it, and are of opinion that it is equally *Ib.*, I. 208.

applicable to tramways. "Railways and tramways," they say, "dealing with urban and suburban traffic should be operated in large systems under suitable regulations to protect the interests of the public. Competition in such cases, is seldom effective, and may be wasteful, while the existence of a number of railways and tramways under separate management, both adds to the working expenses and reduces the facilities for through communication."

Competition not effective.

Competition has unquestionably been carried to mischievous lengths. In their efforts to undersell each other, electric railways, tramways, and omnibuses are, with comparatively few exceptions, carrying on their business, either at a loss, or at a profit which does not yield a fair return upon the capital outlay. This is a state of things which cannot continue indefinitely. The price of transportation like that of any other commodity cannot long be kept below its commercial value, while the failure to earn a reasonable return checks enterprise, and hinders the provision of new facilities for locomotion, which, if not required for the moment, cannot fail to be required in the near future. Excessive competition is attended with other disadvantages. Railways, tramways, and omnibuses compete indiscriminately with each other, and even among themselves, for the same traffic. There is a total absence of such co-ordination as would assign to each its appropriate field of action, within which alone it can operate to the best advantage. There is also overlapping and duplication of services, adding to the congestion of traffic in the streets by superfluous vehicles.

Evils of competition.

Want of co-ordination causes congestion.

RAILWAYS.

Summary of conclusions and recommendations of the Royal Commission.

Before dealing with the present position of railways in and about London, and the changes which have taken place in the course of the last few years, it may be convenient to give a brief summary of Chapter VII. of the Report of the Royal Commission, which contains their recommendations as to railways, and discusses general principles with a fulness and lucidity which leave nothing to be desired.

eport of . C. I. 117.

Under the head of "Characteristics and Functions of Urban Railways," the Commission comment on the heavy cost of urban railways, on the fact that their location cannot be altered after construction, and that the requirements of morning and evening traffic can only be met by railways, as no other mode of transport gives sufficient speed. They draw special attention to the functions of London railways and to the separate requirements of urban and suburban traffic, pointing out that the considerations affecting location, accommodation, and working, are radically different, and to some extent conflicting. Recognising that urban traffic must be mainly along the streets, and that the construction of underground railways has not affected substantially the demand for street conveyances or diminished street congestion, they point out that railways are necessary for long distance urban traffic in so large a city as London. They further discuss the special requirements of suburban, as distinguished from urban, traffic, and the difficulty which has been experienced in carrying both classes of traffic on the same lines.

Cost and conditions of urban railways.

b., I. 118.

Railway traffic in London.

b., I. 119.

Railways necessary for long distance urban and suburban traffic.

b., I. 120.

b., I. 121.

Under the head of the "Nature of Railway Accommodation Required for London," the Commission summarise the needs of London in regard to main trunk lines, suburban, and urban railways, with special reference to the location and adequacy of main terminal stations, their connections with each other, and the distribution of passengers. They make no recommendations with regard to goods traffic, but they draw attention to the mode of distribution of miscellaneous goods in the vicinity of London, and to the effect upon the congestion of the streets and roads of the conveyance of such goods by road instead of by railway.

Needs of London in regard to railways.

b., I. 123.

Goods traffic by road.

b., I. 124.

Under the head of "The Railway System of London as it Now Exists," the Commission point out that London railways must always be considered as an organic system however imperfect and disjointed the system may seem.

The existing railway system.

b., I. 125.

There are 10 main lines of approach, seven to the north of the Thames, and

three to the south, and these, which are the main routes for long distance traffic, with some few exceptions, also afford the principal avenues of approach from all suburban branches. Hence, suburban traffic is chiefly concentrated at the same terminal stations which serve long distance passengers, who, however, form only a small fraction of the total number.

Absence of railways in the central area.

The central area, forming an oval four miles long and 1½ broad, is crossed by only one railway in addition to the underground lines. The annular area, three miles in width, outside the central area, has been filled up with many lines made independently at various times for different purposes. Much inconvenience has arisen from the exclusion of railways from the central area. Connections do exist between all the lines entering London, but they are so laid out that they do not afford so complete and harmonious a system of railway communication as public convenience demands. Report of R. C. I. 12

Suburban branches.

Want of control of railway construction.

Suburban traffic is mainly carried on branches from the main lines. This system, which the Commission commend, has been adopted for reasons of economy, but ceases to be advantageous when the final section of approach becomes so crowded with trains that the latter cannot be dealt with without costly alterations. The evils arising out of this state of things would be less likely to occur if there were better general supervision of railway construction. *Ib.*, I. 127

Inner Circle.

The Metropolitan and Metropolitan District Railways were originally designed for urban traffic, but the working of the Inner Circle system has not afforded sufficient or convenient facilities for central urban movement. The east and west traffic is the really important traffic of the Inner Circle Railway, though it does not afford all the accommodation required in this respect. The companies have therefore adopted a policy of suburban development, and the railways, originally intended for purely urban purposes, are now practically the terminal approaches in London of suburban railways. The lines made for the accommodation of suburban traffic have been allowed to grow up independently without any general guidance, no attempt has been made to co-ordinate them with any general design, and the central communication was dealt with on the erroneous principle of a circle round the central area. *Ib.*, I. 128.

Suburban development.

Defects in design. *Ib.*, I. 129.

In the year 1903, the length of railways, the number of stations, and the proportions of mileage and stations to population and area were as follows :— *Ib.*, I. 130.

	In Administrative County of London.	In Extra London.	In Greater London.
Length in route miles	221·6	378·0	599·6
„ per square mile	1·90	·66	·86
Population per route mile	20,458	5,516	10,976
Number of stations	275	256	531
„ per square mile	2·36	·44	·77
Number of inhabitants per station	16,485	8,000	12,394

Their causes.

The Commission conclude their observations under this head by indicating the causes which produced the defects of the railway system as it then existed. Referring to the recommendation of the Select Committee of the House of Lords in 1863, that every system of internal railway communication should be under one management. they point out that although complete unity of interest can only be secured through extensive amalgamations, the existence of a controlling authority of the character of the Traffic Board, which they recommend, would have imposed a useful check on the evils arising from diversity of management. *Ib.*, I. 131.

Controlling authority would have checked evils.

Under the head of "Questions for consideration in the present day," the Commission proceed to consider the needs for :— *Ib.*, I. 132.

Need for additional railway facilities.

(1.) Additional railways in the central area.

(2.) Facilities for suburban traffic.

(3.) Special assistance towards the construction of railways.

They point out that they cannot deal with such questions in more than a general way, since detailed and prolonged investigations are necessary for their determination. All that they can hope to do is to form some general conclusions as to the facilities required, and whether those facilities are being or are likely to be provided.

Detailed investigation necessary.

eport of . C. 133.

They give a table showing the number of passenger journeys to and from stations of a terminal character within the central area of London during the year 1903, with a view to showing their relative importance from the traffic standpoint. The total number of passenger journeys accounted for in this table is 301,662,501. They then discuss in detail the present and prospective facilities for communication between the various stations and other parts of the Metropolis, and make suggestions for improvements.

Amount of passenger traffic.

b., I. 134–42.

b., I, 143.

Under the head of "Railways" the Commission consider that when the authorized tube railways have been completed, with the addition of a line from Victoria to the Marble Arch, the most pressing requirements of the central area will have been fairly provided for. They recommend that greater attention should be paid to providing interchange stations at intersecting points, and they express the opinion that there should be better connection to the north-east of London, and better connection between suburban systems on the East and West, "with the object of improving central urban communication, and providing passengers with fuller facilities than they now possess by convenient interchange stations for reaching all principal points within the central area served by the central urban railways." After referring to various ways of providing better communication, they say that the choice between them is a matter involving detailed and protracted consideration, and is one of the questions that would be dealt with by the Traffic Board.

Tube railways will provide for requirements of central area.

Need for interchange and improved thorough communication.

b., I. 144.

A question for the Traffic Board.

Ib., I. 145.

They proceed to consider the question of finance, and the difficulty experienced in raising capital for underground railways, mainly owing to the small returns on Capital expended on such undertakings. They state that the "Capital of underground railways, under existing conditions, may amount to from £500,000 to £1,000,000 per mile, and a very heavy traffic is required to pay a fair rate of interest on a Capital of this magnitude." They consider, however, that "as in the past, so in the future, London should, as far as possible, rely wholly upon private enterprise for the construction of new railways"; and they hold that private enterprise can be relied upon, provided that railways are made and worked on a commercial basis. They regard the uncertainty of the present system of procedure as a greater evil than its cost, and they "look to the influence of the proposed Traffic Board as likely to effect an improvement in this respect." They dwell on the importance of not imposing onerous conditions on proposed railways such as charging them with the cost of street improvements and works of that character, though they consider that in some cases such works might be jointly arranged with advantage both to the Railway Company and the Municipality. They finally recommend that power to buy land by agreement should be conferred on Railway Companies, so that they may share in the benefit which the making of a new railway confers upon the district which it serves.

Finance of London railways.

Private enterprise should be relied on.

Ib., I. 146.

Onerous conditions should not be imposed.

Railways should be empowered to buy land.

Ib., I. 147.

Under the head of "Railways in Shallow Subways" the Commission discuss the comparative advantages of Tube Railways and of Railways in Shallow Subways, the relative cost of the two systems, the interference with traffic during construction, the avoidance of damage to property, and questions of detail in regard to ventilation, space in the tunnels, and the working of lifts.

Comparative advantages of tubes and shallow subways.

Ib., I. 148.

The consideration of all these matters leads them to the conclusion that preference should be given to the shallow form of construction wherever it can be satisfactorily employed in London. They wish it to be understood that they are not adverse to "tubes," recognising that in certain cases "tubes" may be a necessity if a railway is to be made at all, and that they may in other cases be preferable. But they think that "in all future projects for urban railways, the fullest consideration should be given to the many points in which the shallow form of construction offers the greater permanent advantages."

Four tracks should be provided.

They express the opinion that "wherever it is at all practicable it is most desirable that urban railways traversing London from side to side should have four lines of way in order to provide a separate service for express and for stopping trains, and thus admit, by means of comparatively few interchange stations, of rapid transit to the suburbs from all the stations on the local service lines." They refer to a suggestion made by the Advisory Board of Engineers "that it may be practicable to construct a cheaper type of tube railway specially suited for long distance traffic, with fewer stopping places, and with the track rising to stations at the surface where the use of lifts would be unnecessary"; and they quote the opinion of the Board that such express lines with few stations might be made at a cost including equipment of from £250,000 to £300,000 per mile, if Parliament and the public bodies co-operated in assisting such undertakings by giving all facilities for their construction. They point out that "if lines of this nature can be constructed at a capital cost on which the traffic carried will give even a moderate return, a great difficulty in connection with the housing problem will be removed."

Cheap form of construction mentioned by Advisory Board of Engineers.

Report of R. C. I. 149.

Assistance that might be given to railway construction.

They also point out that there are several ways in which assistance might be given, which would cost the public little or nothing, and yet materially reduce the cost of construction of tube railways. They consider that Way-leaves should be granted on payment for structural damages only, in cases where tubes do not follow the line of the streets. If this course is not followed they are of opinion that the payments to be made should be either on a fixed and very moderate scale per yard, or be assessed cheaply and expeditiously by some competent authority so as to avoid numerous separate and costly arbitrations.

Ib., I. 150.

Municipal authorities might be empowered to assist

If private enterprise will not make such railways, the Commission "have no hesitation in recommending that the municipal authorities should be empowered to assist," and they think "it would be preferable to use the Municipal credit for this purpose or even to incur direct expenditure rather than to build houses in the centre of London for the working classes at a cost which leaves a heavy burden on the rates." They suggest that consent might be given in some cases to the construction of underground railways under Royal Parks, and that any proposal of this nature should be referred for special investigation to the Traffic Board. Finally, they suggest that if the London County Council gave assistance in the construction of an underground railway, they might be allowed to acquire land at the outer extremity and let it for building purposes, with a view to recovering a portion of the expenditure.

and might be allowed to acquire and dispose of land.

Ib., I. 151.

Advantages of unified management.

Under the head of "Operation of Urban Railways and Tramways in Large Systems," the Commission observe that "all large systems of mechanical traction can be worked most economically and with the greatest advantage to the public when they are under one and the same management." They believe that amalgamation can be carried out with advantage to all concerned, but should only be allowed on terms which secure the interests of the public. Referring to the controlling power secured by the Underground Electric Railways Company of London over three separate tube railways, coupled with the influence which they exercise over the Metropolitan District Railway and the London United Tramways Company, the Commission remark that "such unified management is a gain and not a disadvantage," but they think that "the conditions under which amalgamation of a more or less complete nature takes place should be examined and approved by some public authority. The wider the area covered by what is, or is likely to become, a monopoly, the greater is the necessity for regulations to safeguard the interests of the public." Evidence was given to the Commission that there would be no indisposition on the part of the Company to lay the whole scheme for amalgamation before Parliament and take a decision on the merits when the proper time came. The Commission are "satisfied that the formation of the Company has been of material assistance in raising the capital for works which will be of great public benefit."

Ib., I. 152.

Public interest must be secured.

Ib., I. 153.

The Underground Electric Railways Company of London.

Report of R. C. I. 154. Under the head of "Other questions connected with London Railways" the Commission discuss various subjects, such as the overcrowding of trains, so noticeable at the so-called "rush hours," and the steps taken to minimise this evil; the speed of trains on London railways; fares—as to which they observe that "every encouragement should be given to the adoption of a uniform fare of 2*d.* per journey up to the limit which could reasonably be covered for that fare, and for distances beyond that limit, uniform fares, possibly on a zone basis," as tending to spread the population over a wide area and encourage people to go where land is cheaper and the surroundings are healthier. They cannot see their way to recommend that railway companies should be compelled to run unremunerative trains for the purpose of developing new districts, but they think it would be an advantage if local authorities were enabled to guarantee minimum receipts in such cases, and they express the belief that in this way local authorities in co-operation with landowners "might frequently, at a very small cost, secure the development of building land much more rapidly than can be done without the assistance of such arrangements."

Over-crowding.

Ib., I. 155. *Speed.*

Ib., I. 156 and 157. *Fares.*

Ib., I. 158. *Local authorities and others might guarantee receipts.*

Ib., I. 159. Lastly they refer to the advantages offered by electric as compared with steam working, and express the hope "that there may be no great delay before the railway companies serving London adopt electric traction for the working of their suburban train service."

Advantages of electrical working.

Recent changes in the railway system of London.

Much of the evidence upon which the Report of the Royal Commission was founded was taken in 1903. It will therefore be convenient to take that year as the point of departure, and to consider the changes which have taken place in the period of five years from 1903 to 1907.

Although the railway system of London as a whole may not appear to have altered materially in the course of the five years, 67 miles of new railways have been opened for traffic—an addition of more than 11 per cent., and great changes have taken place arising partly from the nature of the additions, and partly from improvements in working.

Improvements and additions.

The length of passenger lines and the number of passenger stations open for traffic on the railways of Greater London in the years 1903 and 1907 were as follows:—

Mileage of railways and number of stations.

Year.	Length of passenger lines.			Number of passenger stations.		
	County of London.	Extra London.	Total Greater London.	County of London.	Extra London.	Total Greater London.
1903 ...	221·6	378·0	599·6	275	256	531
1907 ...	247·8	419·0	666·8	329	275	604

Within the County of London the increase in mileage and in the number of passenger stations is wholly accounted for by the tube railways, of which the following were opened in the course of the five years:—

New tube railways.

	m.	ch.
Great Northern and City, from Moorgate Street to Finsbury Park	3	42
Baker Street and Waterloo, from Elephant and Castle to Edgware Road	4	27
Great Northern, Piccadilly and Brompton, from Finsbury Park to Hammersmith	9	0
Great Northern, Piccadilly and Brompton, from Holborn to Strand	·0	40
Charing Cross, Euston and Hampstead, from Charing Cross to Golders Green and Highgate	8	8
City and South London extension from the Angel to Euston ...	1	19
Total	26	56

New railways in Outer London.

The increases in Extra London are mainly accounted for by the following new lines opened in the course of the five years :—

	m.	ch.
Great Western. West London Junction to Northolt	9	19
Great Central. Neasden to Northolt	6	29
Great Western and Great Central Joint. Northolt to boundary of Greater London	5	0
Great Eastern. Woodford to Ilford	5	77
Metropolitan. Harrow and Uxbridge	7	41
Metropolitan District. Ealing and South Harrow	5	3
South Eastern and Chatham. Chislehurst loops...	1	56
Total	40	45

Widenings and improvements to stations.

In addition to these new lines important widenings were carried out on most of the trunk railways entering London, while large and costly improvements to stations have either been completed or have been carried far towards completion—notably at Victoria and Waterloo.

Victoria Station.

The reconstruction of Victoria Station by the London, Brighton and South Coast Railway Company has been a work of great magnitude. The station has been doubled in size, and covers nearly 16 acres. It has cost considerably over a million sterling, and the difficulty of dealing with the traffic while the alteration was going on has been very great. In designing the station, arrangements have been made to separate the suburban from the main line traffic, with special provision for electric trains.

In addition to the work carried out by the Brighton Company, the South Eastern and Chatham Company are making extensive alterations and improvements in their portion of the station.

New railways recently authorised.

The following new railways authorised in the course of the five years 1903–1907, in addition to certain widenings and small extensions, had not been constructed at the end of 1907 :—

	m.	ch.
Baker Street and Waterloo. Paddington extension	0	43
Great Western. Ealing and Shepherd's Bush	4	38
Central London. Shepherd's Bush loop	0	43
London and North Western. Euston to Watford	19	0
North West London extension. Victoria to Marble Arch ...	1	51
North East London. City to Waltham Abbey	14	60
Watford and Edgware	6	17

Baker Street and Waterloo extension.

The extension of the Baker Street and Waterloo Railway from the existing terminus at Edgware Road to Paddington Station was authorised in 1906, and powers to construct run until 1911. The company are not at present proceeding with the extension, owing, it is believed, to differences with the Great Western.

Ealing to Shepherd's Bush.

The new line of the Great Western from Ealing to Shepherd's Bush was authorised in 1905. The company's powers for construction run until 1910. It is understood that much of the land has been acquired, but construction has not been commenced.

Central London extension at Shepherd's Bush.

The construction of a loop at the Shepherd's Bush extremity of the Central London Railway, 43 chains in length, was authorised in 1907. The loop, which was opened for traffic in May, 1908, improves the working of this railway in various ways, such as by enabling the trains to be run round from the up to the down line, and by giving facilities for varying the length of trains to suit the traffic requirements of different times of the day. It affords convenient access to the Franco-British Exhibition by means of a station in Wood Lane.

Euston to Watford.

The proposed new electric railway of the London and North Western from Euston to Watford was authorised in 1907. The Railway, which is distinct from, but follows the general direction of, the main line, will be in the open, with the exception of the first two and a half miles out of Euston, which are in tube, and there will be several intermediate stations. It will form a loop under Euston Station with an underground station in close proximity to the stations

of the City and South London, and the Charing Cross, Euston and Hampstead Railways. The construction has not been commenced owing, it is believed, to unfavourable conditions of the money market.

Marble Arch to Victoria.

The extension of the authorised North West London Railway from Marble Arch to Victoria was authorised in 1906. The powers for construction run until 1910, but may be terminated by the Board of Trade on the application of the London County Council, failing a substantial commencement of the work before August, 1908. It does not seem likely at present that this useful line will be constructed.

North East London.

The North East London—an electric railway, partly in tube, from the City to Waltham Abbey—was authorised in 1905. The time for construction, as extended by the Company's Act of 1907, ran till 1912, with the proviso that the company's powers should cease unless half of their capital were subscribed by the 11th August, 1908, and the works were commenced by the 11th August, 1909. An extension of time was, however, granted by Parliament in the Session of 1908.

Watford and Edgware.

The Watford and Edgware Electric Railway was authorised in 1903 but has not been commenced. The time for construction will expire in August, 1911.

Complete lists of new railways opened for traffic and authorised but not constructed in the course of the five years will be found in the Appendix.(1)

There were also at the end of 1907 unexpired powers, given before 1903, for the construction of other lines. The most important of them were :—

West Kensington to Mansion House.

(1) Metropolitan District deep level line from West Kensington to Mansion House station, of which a section between West Kensington and South Kensington has been constructed by the Great Northern, Piccadilly and Brompton Company under powers transferred to that company in 1903. The remainder of this line will be abandoned.

City and Brixton.

(2) City and South London new tube line from the City to Brixton, which has now been abandoned.

Edgware and Hampstead.

(3) Edgware and Hampstead.—Time for acquisition of land runs till November, 1908, and for construction till 1910, but it is doubtful whether the powers will be exercised. The line is a good one, as it would practically extend the Charing Cross, Euston and Hampstead Railway from Golder's Green to Edgware, with a further extension to Watford, should the authorised Watford-Edgware Railway be constructed.

Enfield and Stevenage.

(4) Great Northern.—Extension of the Enfield branch to Hertford and Stevenage. The first section of this line five miles in length from Enfield to Cuffley, is making rapid progress and is far advanced towards completion. The construction of the remainder of the line is deferred for the present. This important loop, the total length of which is 19½ miles, will afford more direct communication between Hertford and London, and it will obviate the necessity of duplicating a section of the main line, which the requirements of through traffic demand. The duplication of the main line would involve heavy engineering works, the cost of which would exceed the cost of constructing the new line. The latter presents less physical difficulty, and has the additional merit of opening up a new residential district.

North West London.

(5) North West London Electric Tube Railway from Cricklewood to Marble Arch, authorized in 1899. This with the extension to Victoria, authorized in 1906, would be a very useful line. The powers for construction as extended by the Act of 1906 run till August, 1910, but it is to be feared that it will not be proceeded with, owing to the difficulty of raising capital.

Adoption of electrical working on Inner Circle and other railways.

The most important change that has occurred in the working of London railways has been the substitution of electrical for steam power on the systems of the Metropolitan and Metropolitan District Railways; on sections of the London and South Western, and London, Tilbury and Southend Railways, over which the District Railway has running powers; on lines such as the Hammersmith and City, or the Whitechapel and Bow Railways, which are partly owned by one or the other, and on a short section of the Great Western.

(1) Appendix B., I. and II.

The following table shows the years in which electrical working was introduced on all the railways in London to which it has yet been applied.([1]).

Year.	Railway.	Route.	Length.	Total length opened each year.	Total length open for electric traction at the end of each year.
			m. ch.	m. ch.	m. ch.
1890	City and South London	King William Street, City, to Stockwell.	3 12	3 12	3 12
1898	Waterloo and City ...	Bank to Waterloo ...	1 42	1 42	4 54
1900	Central London	Bank to Shepherd's Bush	5 66	7 32	12 6
	City and South London	Extensions to Clapham and Moorgate Street.	1 46		
1901	Ditto ditto	Moorgate Street to Angel, Islington.	1 28	1 28	13 34
1903	Metropolitan District ...	Mill Hill Park to Harrow	6 1	6 1	19 35
1904	Great Northern and City	Moorgate Street to Finsbury Park.	3 42	3 42	22 77
1905	Metropolitan and Metropolitan District.	Inner Circle and branches and lines worked in connection.	55 69	55 69	78 66
1906	Baker Street and Waterloo	Baker Street to Elephant and Castle.	4 0	18 64	97 50
	Great Northern, Piccadilly and Brompton.	Finsbury Park to Hamsmith.	9 0		
	Metropolitan and Metropolitan District and Great Western.	Lines and junctions in connection with systems.	5 64		
1907	Charing Cross, Euston and Hampstead.	Charing Cross to Golder's Green and Highgate.	8 8	10 14	107 64
	Baker Street and Waterloo	Baker Street to Edgware Road.	0 27		
	City and South London	Angel, Islington, to Euston.	1 19		
	Great Northern, Piccadilly and Brompton.	Holborn to Strand ...	0 40		

The effect on traffic of the conversion from steam to electrical working will be referred to later on.

Among other changes that have taken place may be mentioned :—

Working agreement between Metropolitan and Great Central Railways.

(1) The joint working of the line between Harrow and Verney Junction by the Metropolitan and Great Central Companies, which has proved satisfactory to both, has given increased facilities to the public, and has led to a development of the district for residential purposes which would have been impossible under previous conditions.

Working of Inner Circle by Metropolitan.

(2) The working of the Inner Circle service wholly by the Metropolitan, instead of alternately by that Company and the District, which has resulted in greater regularity and punctuality, and in saving of expense.

Automatic signalling.

(3) The extended use of automatic signalling.

Interchange and through booking.

(4) The increase of interchange facilities among the tube railways, and the extension of the system of through booking.

Changes in suburban services of trunk railways.

(5) Changes in the number of suburban trains on the main trunk lines. These are shown by a comparison of the tables furnished by Mr. Harper, the Statistical Officer of the London County Council, to the Royal Commission in 1903, and to the Board of Trade in 1908([2]). It will be seen that the number of trains in each day inwards to the principal termini in London in the years 1903 and 1907 were :

([1]) For further details see Appendix B—III.
([2]) Appendix C—IV : Tables 5 and 6.

Terminus.	Total Number of Suburban Trains.		Number of Suburban Trains from earliest workman's trains to between 10 and 11 a.m.	
	1908.	1907.	1908.	1907.
Liverpool Street	380	388	149	150
Fenchurch Street	232	237	79	76
London Bridge	213	215	96	92
Cannon Street	59	110	37	49
Charing Cross	152	160	45	47
Waterloo	256	293	96	92
Victoria	306	289	83	81
Paddington and Bishop's Road ...	39	63	9	23
Marylebone	—	49	—	16
Euston Square	36	46	17	19
St. Pancras	38	47	14	20
King's Cross	60	67	37	41
Total	1,801	1,964	662	706

This, however, is not a complete statement of suburban trains entering London, as there are many other stations of a terminal character. Taking the whole of these, Mr. Harper's tables seem to show that the daily number of suburban trains inwards has risen from 4,252 in 1903 to 7,304 in 1907, but this great increase is mainly accounted for by reckoning stations on the tube railways as terminal stations, and can hardly be taken as implying a corresponding increase in suburban as distinguished from urban traffic.

Activity of railway enterprise between 1903 and 1907.

It will be seen that the period between 1903 and 1907 was marked by great activity in railway construction in London, and was signalised in particular by the opening of 26½ miles of new tube railways; while the same period saw the substitution of electrical for steam working on the systems of the Metropolitan and Metropolitan District Railways, and on various lines working in connection with them. These works, coupled with the improvements in working which they have rendered possible, have had an effect on London traffic for which no parallel can be found since the introduction of railways. Some idea of the extent to which they have stimulated movement is afforded by the fact that more than 1,200 millions of passenger journeys were taken on electrical railways in the course of the five years from 1903 to 1907, and that 70 millions more journeys were taken in 1907 than had been taken in 1903. Traffic is still increasing, and the new lines have not yet had time to develop their full capacity.

Increase of passenger traffic on urban railways.

Public are slow to avail themselves of new facilities offered by tube railways.

The convenience afforded by new facilities is seldom discovered or appreciated by the public until some time after they have become available. The three new tube railways furnish examples of this curious fact, and the experience was the same in each case. For the first few months the traffic was small, and it afterwards expanded in a remarkable way. The first section of the Baker Street and Waterloo Railway was opened in March, 1906, and the last in March, 1907. The receipts for the first twelve weeks of 1907 are stated by Sir Edgar Speyer(1) to have been £645 per route mile per week. For the first twelve weeks of 1908 the corresponding figure was £728, an increase of about 13 per cent. The Great Northern, Piccadilly and Brompton Railway was opened in December, 1906, and the receipts for the first twelve weeks rose from £425 per route mile per week in 1907 to £584 in 1908, an increase of 37½ per cent. The Charing Cross, Euston and Hampstead Railway was opened in June, 1907. It started with earnings at the rate of £335 per route mile per week, and in May, 1908, they had increased to over £400 per mile per week.

So great has been the increase in travelling facilities afforded in recent years not only by railways but by tramways and motor vehicles, that for the moment the requirements of the central area have been more than met. Sir

(1) Speech to shareholders of the Underground Electric Railways Company of London, 11th May, 1908.

Supply of facilities has outrun the demand.

Charles McLaren(1), chairman of the Metropolitan Railway, observed that "the facilities for travel in and about London have increased enormously within the last few years, and there is no doubt that for the time being the supply of such facilities has outrun the demand. I say 'for the time being' advisedly, because we have no reason whatever to doubt that the same result will very soon follow as in other places where a similar set of circumstances has prevailed, namely, that the provision of the facilities for travel will itself create the necessary demand . . . . . Now that we have got in London systems of conveyance which are different, but still as comprehensive as those in New York, we may confidently expect to see a very large increase indeed in the travelling habit of the people. There is no reason to suppose that the inhabitants of London, particularly business men, value their time any less than the inhabitants of New York; and when they appreciate the fact that they can save a few minutes several times a day by taking an electric train from one part of London to another or even from one street to another, instead of walking, they will not hesitate to save the time."

Increase in the travelling habit of the people.

The number of journeys per head calculated on figures supplied by Mr. Harper, has increased from 142·9 in 1903, to 177·5 in 1907. It is increasing at an accelerating rate, the population itself is growing, and there can be little doubt that the time is fast approaching when the demand for travelling facilities will overtake the existing supply.

Short account of the electric railways of London.

Metropolitan and Metropolitan District Railways.

The early history of the Metropolitan and Metropolitan District Railways is given in full detail in the Report of the Royal Commission, and need not be repeated. Since the final completion of the Inner Circle in 1884, both the railways which own and work it have constructed or acquired extensive branches. The Metropolitan have a branch line from Baker Street to Harrow and Uxbridge; they work the line from Harrow to Verney Junction, a distance of 41 miles, jointly with the Great Central; and they are joint owners with the Great Western of the Hammersmith and City Railway.

Report of R. C. I. 41, 42, 45, and 49.

The Metropolitan District Railway own branches to Putney, Hammersmith, Hounslow, Ealing, and Harrow; they own the line from Aldgate to Whitechapel jointly with the Metropolitan; the Whitechapel and Bow Railway jointly with the London, Tilbury and Southend; and they have running powers over branches of the London and South Western to Wimbledon and Richmond, and over the London, Tilbury and Southend to Barking. These branches bring both companies a large suburban traffic in addition to the urban traffic which they were originally designed to carry.

City and South London.

The earliest of the tube railways, the City and South London, was authorised in 1884, and the first section of it from King William Street to Stockwell, 3 miles and 12 chains in length, was opened in 1890. Extensions to Moorgate Street, 48 chains, and to Clapham Common, 78 chains, were opened in 1900; to the Angel at Islington, 1 mile 28 chains, in 1901; and to Euston, 1 mile 19 chains in 1907. Subway communications, giving interchange facilities with other railways, were made from time to time. In 1903 the company acquired

City and Brixton.

powers to construct a line from the City to Brixton, but the proposed line has been abandoned. The total mileage in operation is 7 miles 25 chains.

Central London.

The Central London Railway, 5 miles 66 chains in length from Shepherd's Bush to the Bank, was authorised in 1891 and opened in 1900. A loop at Shepherd's Bush, 43 chains long, authorised in 1907, was completed and opened in May, 1908.

Waterloo and City.

The Waterloo and City Railway, 1 mile 42 chains in length from Waterloo Station to the Bank, was authorised in 1893 and opened in 1899. It was absorbed by the London and South Western in 1907, and now forms part of their system.

Great Northern and City.

The Great Northern and City Railway, 3 miles 42 chains in length from Finsbury Park to Moorgate Street, was authorised in 1892 and opened in 1904. The company have powers to extend the line to Lothbury, but it is said that the extension will not be proceeded with until traffic is sufficient to justify the raising of further capital.

(1) Speech at half-yearly meeting 29th January, 1908.

Baker Street and Waterloo.

The Baker Street and Waterloo Railway, 4 miles 27 chains in length was authorised in 1893, and the first section between Baker Street and Westminster Bridge Road was opened in 1906. The remaining sections were opened in 1906 and 1907, and the line terminates at Edgware Road. The authorised extension to Paddington Station, though much to be desired, is not being proceeded with.

Charing Cross, Euston, and Hampstead.

The Charing Cross, Euston and Hampstead Railway, 8 miles 8 chains in length, was authorised in 1893 and opened in 1907. The line bifurcates at Camden Town and has terminal stations at Golder's Green and Highgate.

Great Northern, Piccadilly, and Brompton.

The Great Northern, Piccadilly, and Brompton Railway, is an amalgamation of the Brompton and Piccadilly Circus Railway authorised in 1897, and the Great Northern and Strand authorised in 1899. The line was extended from South Kensington to West Kensington, under deep level powers transferred from the Metropolitan District Railway in 1903, and was further extended to Hammersmith on the widened line of the District Railway. It was opened in 1906. A branch from Holborn to the Strand, 40 chains in length, was opened in 1907. The total length of the railway is 9 miles 40 chains.

Joint Select Committee of 1901.

Report of R. C. I. 53. The Royal Commission refer to the recommendations of the Joint Select Committee appointed in 1901 to report upon the large number of projects for the construction of tube railways which were then before Parliament, and remark that the general questions connected with the construction of tube railways still remain in the stage in which they were left by the Committee. They add that "the deep level railways as they exist in London have been designed and laid down in accordance with the proposals of different promoters, without special examination beforehand of the whole problem, and without continuous control by a single authority. The Metropolitan Board of Works was abolished in 1889 and the London County Council was established in the same year, but the latter body was not given any authority in connection with railways proposed to be constructed in the Metropolis. The construction of such railways was left to private enterprise, and the promoters obtained their authority to construct by means of Private Bills. The reference to the Joint Select Committee of 1901, and the remarks which we have quoted from the Report of that Committee, show clearly the nature of the evils that were caused by the non-existence of a competent central authority. The London County Council had no power to control the construction of such railways, and an attempt to exercise, in the interests of the public, such control as is possible by formal opposition to Private Bills, does not give satisfactory results, while it adds to the cost of the undertaking, and tends to produce a state of antagonism between the Companies and the Council, which is greatly to be regretted, and is detrimental to the public interests."

***Ib.*, I. 55.** The Commission conclude their historical review by referring to the various recommendations made in the past by Royal Commissions and Select Committees and add that "it is impossible to overlook the importance or significance of these recommendations." No steps, however, have so far been taken to give them practical effect.

Better results might have been obtained had railways been laid out on a system.

Had the tube railways been laid out from the first as a complete system on a well considered plan, and had the authorities favoured and furthered their construction, without necessarily incurring any financial responsibility themselves, expenses might have been largely reduced, and better accommodation might have been given to the public.

Considerations affecting the construction and working of railways in London.

Cost of construction and financial results of tube railways.

***Ib.*, I. 145.** The capital of underground railways, as stated by the Commission may, under existing conditions, amount to from £500,000 to £1,000,000 per mile. The actual cost of construction is much less. The shallow subways in Paris are said to have cost little more than £300,000 per mile, including equipment, and had the tube railways been made under equally favourable conditions, there is little reason to doubt that the capital expenditure need not have exceeded an amount which would have admitted of a fair return. Such a result would have encouraged private enterprise to embark on other undertakings of the same kind with manifest advantage to the public. As it is, the financial results of the

tube railways have not been such as to tempt promoters into the field, and so far as can be seen at present there is no prospect of a resumption in the immediate future of railway enterprise on a scale approaching the activity of the last five years.

Private enterprise should not be subject to undue burdens.

The Royal Commission expressed the opinion that "there is no need, as yet, to make any alteration in the present system of private promotion in the direction of looking to public sources for any part of the funds required for railway enterprise, unless undue financial obligations are thrown upon the railway undertakings either in respect of works or compensation, or in regard to the carrying of passengers at unremunerative fares or otherwise. All that in our judgment is necessary, is to see that no discouragement shall be created for private enterprise by the system of procedure under which railway undertakings are authorised, or by the imposition of undue burdens on, or exaction of impossible conditions from promoters." Report of R. C. I. 145.

Municipal assistance may be desirable.

Recurring to the same point they say, "If undue burdens are not thrown upon railway undertakings, it will not be necessary to give direct assistance to new railways from public sources. But so much importance do we attach to the construction of railways to new residential districts, that if private enterprise will not make such railways, we have no hesitation in recommending that the municipal authorities should be empowered to assist. The form in which assistance would be given might vary with the circumstances of the case. The municipal credit might be used to raise the capital cheaply, or the municipal authorities might take shares or find a portion of the capital at a low rate of interest, or arrange for a total or partial remission of local rates; in some cases they could grant space for stations free of charge." *Ib.*, I. 150.

Burdens on tube railways.

So far no action has been taken upon any of these suggestions, and on the contrary burdens have been put upon the tube railways which they can ill afford to bear. The rates and taxes upon the electric railways have been stated by Sir Edgar Speyer(1) to have amounted to £81,168 in the half-year ending on the 31st December, 1907; and on three of the tube railways—namely, the Baker Street and Waterloo, the Great Northern, Piccadilly, and Brompton, and the Charing Cross, Euston and Hampstead, they amounted to £15,572 in the same half-year. In the same period the net surplus income of the three tubes, after payment of fixed charges, was £9,319. It is not to be wondered at, in view of these results, that private enterprise has been discouraged, and that promoters are unwilling to undertake the construction of tube railways.

There would appear to be some reasons for giving special consideration to the case of underground railways in relation to local taxation. Their existence entails no expense upon the localities, and even adds to their rateable value. By taking traffic off the streets they diminish the wear of the roads, and to some extent relieve the local authorities from the expense of costly widenings. Their competitors on the other hand, who use the roads, contribute nothing to the rates, in respect of such use, while in many cases motor omnibuses depreciate the value of property.

New railways likely to be made.

The only new railways of any magnitude which so far as can be seen at present are likely to be made are the Great Northern line from Cuffley to Stevenage, the Great Western line from Ealing to Shepherd's Bush, and the London and North Western line from Euston to Watford, all of which, however, are for the moment in abeyance. As the lines are promoted by powerful Railway Companies they will, if constructed, be made under the most favourable conditions.

Separation of local and through traffic on trunk railways.

The last two will both serve a double purpose, namely, the development of rapidly growing districts, and the relief of terminal sections from congestion. The intention to construct these two lines is a practical recognition of an important principle. The Royal Commission observed "whether the same tracks can be used within the central area for trains serving both classes of traffic, or to what extent they can be so used, are questions of practical railway working, but it is obvious that the use of a line for one of these kinds of traffic may destroy or impair its utility for the other." And again, "railways intended for urban traffic have been used, and partly designed for suburban traffic to an extent and under conditions which have adversely affected their utility for both *Ib.*, I. 118. *Ib.*

(1) Speech to Shareholders of Underground Electric Railways Company of London, 11th May, 1908.

purposes." These remarks though primarily directed to the expediency of separating urban from suburban traffic, are equally applicable to the separation of suburban from long distance traffic. Suburban traffic tends to grow until the final section of the approach to a terminus becomes crowded up to the limit of its capacity. The cost of widening in London has become so heavy as to be practically prohibitive, while the increased capacity afforded by widening is attended by a positive disadvantage, inasmuch as it adds to congestion at the terminus itself. The alternative lies in diverting suburban passengers from the terminus, by providing a separate road for their use, setting the main line and the terminal station free for the long distance traffic. This is the solution which the two companies propose to adopt. In the case of the Great Western, the new line will carry Ealing passengers, and passengers who change from main line trains at Ealing, to Shepherd's Bush, from which point they can proceed to any station on the Central London or West London Railways, or by means of interchange stations to any other part of London. Paddington station will at the same time be relieved of all passengers who elect to use the alternative line.

In the case of the London and North Western, the solution, though different in form, is the same in principle. The new line from Watford will be entirely separate from the main line, though following the same general course. For the last two-and-a-half miles into London it will be carried in tube under the main line, forming a loop under the Euston station, so laid out as to afford easy interchange with the City and South London and the Charing Cross, Euston and Hampstead Railways. Every facility will thus be afforded to passengers arriving at Euston by the new line to distribute themselves without coming to the surface, the terminus will be relieved of suburban passengers, and the main line will be relieved of stopping trains. The proposed line is a good example of a purely suburban railway, since a loop at the Watford end will serve a large area or gathering ground, and the existence of loops at both ends will admit of trains being worked round and round without the delay and inconvenience incidental to shunting at dead end terminal stations.

Expansion of London due to the railways.

The growth of London which has been so marked in the last 60 years, is due to the railways. Without them the Metropolis could not have reached its present dimensions. But the capacity of the railways is limited ; the limit had latterly been approached ; and if the conditions which then prevailed had continued, either additional railway accommodation must have been provided, or London must have ceased to grow. So far, however, from continuing unchanged, the conditions are changing in a very remarkable way, and there is no reason to apprehend any check to the expansion of London for a considerable time to come, even without material increase of railway accommodation—desirable as such increase would be.

Change of conditions owing to growth of tramways.

The Trunk Railways—especially those which enter London on the south and east sides—spent many millions of money on branch lines and stations expressly designed to serve the needs of the growing population, and every year carried many millions of people who had no other speedy means of travelling between their homes in the outskirts and the centre of London. The volume of this traffic, though still large, has diminished considerably in recent years through the competition of tramways, and latterly of motor vehicles. An alternative means of travel, offering greater facilities and advantages for short distances, has come into existence ; it is daily growing in extent and efficiency, and bids fair to oust the railways from a field which they had made their own. The movement began to assume serious proportions five years ago, it has continued with ever-increasing force, and it appears likely to bring about a fundamental change in the relation between the railways and suburban traffic.

This subject, which is dealt with at greater length below, is mentioned here in connection with the influence of the great railways on the growth of London, and the changes which seem to be impending under the new conditions which have come into existence. Suburbs have spread more on the south and east sides than on the north and west, owing to the fact that some of the railways, such as the London and South Western, the South Eastern and Chatham, the London, Brighton and South Coast, the Great Eastern, and the Great Northern, laid themselves out to cater for suburban traffic in an especial degree ; while

Some railways suffer more than others.

others, such as the London and North Western, Midland, Great Central, and Great Western, paid more attention to the development of long distance traffic. The members of the first group are consequently the greater sufferers from the new competition. It is, however, to be observed that large decreases in the number of passengers carried have often been accompanied by comparatively small losses in receipts, and in some cases even by gains. For instance, although in the second half of 1907 the London and South Western Railway carried 1,328,305 fewer passengers than they carried in the corresponding half of 1906, they gained £9,207 in receipts; while in the same period the South Eastern and Chatham carried 2,615,272 fewer passengers with a loss in receipts of only £16,821. Taking 3rd class passengers alone, the two companies together carried 3,480,874 fewer without any loss at all in money. These figures point to the conclusion that the loss which has taken place is in the least profitable kind of traffic, and that although fewer passengers were carried in 1907 than in 1906, the losses were made up for in other directions.

Loss in receipts small in comparison with diminished traffic.

Diversion of traffic from the railways.

The force of circumstances is diverting short distance traffic from the railways. Whether it is better to aim at retaining as much of it as they can, and possibly at recovering what they have lost; or to accept the situation, and apply their efforts to the development of outer suburban traffic, are questions which each railway company must consider for itself. If the needs for locomotion to a distance of eight or ten miles from the centre of London were largely met by other means, and the main lines of railway entering London were less encumbered with slow trains stopping at numerous stations, the companies might see their way to give a better service to the outlying suburbs, and stimulate the outward movement of the population which is taking place, with benefit to the public and possibly with advantage to themselves.

Singular position of Great Central Railway.

The Great Central Railway occupies in this respect a unique and enviable position, inasmuch as it is prohibited by Statute from stopping its trains between Harrow and Marylebone Stations, a distance of nine and half miles. The line is, however, a new one, and there is no question in this instance of discontinuing the use of costly stations; while the local needs of the district, through which this section of the Great Central passes, are provided for by the parallel line of the Metropolitan, which has a number of intermediate stations. These two railways taken together furnish an instance of [redacted] provision for local and through traffic, which is so desirable from [redacted] view. They reproduce in some degree the plan adopted in New York, of providing separate tracks for fast and slow traffic.

Effect of new railways on localities.

Much has already been done by the railway companies, and the growth of population in suburban districts shows how quickly the latter respond to improved facilities for locomotion. The provision of better means of access [redacted]ion has an immediate effect. Houses spring up at once, and land rises in value. Examples of this may be seen on the new Great Western and Great Central Joint Line, on the line north of Harrow worked jointly by the Great Central and the Metropolitan Companies, in the neighbourhood of Upminster and Hornchurch on the London, Tilbury and Southend Railway, and in many other directions. It is only in districts in which landowners are unwilling to sell land, or to let it for building, that little or nothing can be done.

Travelling between London and outer suburban districts.

The number of people who live in the country and travel daily to their business in London is constantly increasing. Such people measure distance by time rather than by miles, and the further the railways will carry them within an hour, the further they will go. At the end of 1907, 4,000 season tickets were in use between Southend and Fenchurch Street, a distance of 36 miles—covered by the fastest trains in 50 minutes. There are some who come up to London daily from places as far distant as Brighton, 50½ miles, wherever in fact a fast and convenient service is provided, and the time occupied by the journey does not much exceed an hour; considerable numbers come from distances of about 30 miles; more travel 20 miles each way every day; and a still larger number including those who use workmen's tickets, make daily journeys to and from their work in London of less than 20 miles.

Railway Companies have a double interest in promoting the development of residential districts outside the immediate neighbourbood of London, since at distances of 20 miles or more they carry, not only the people themselves,

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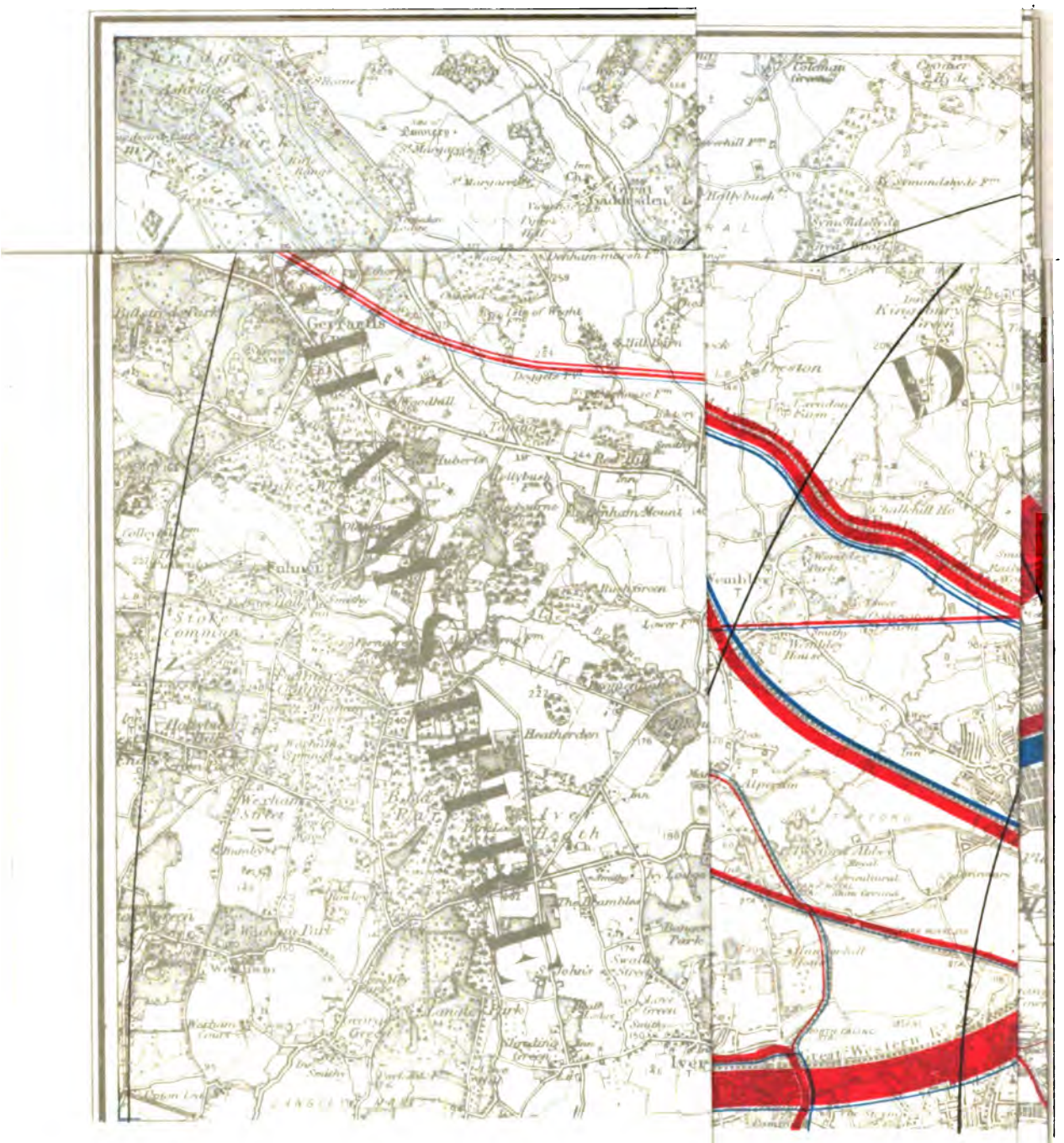
Gerrards
Stoke Common
Fulmer
Iver
Iver Heath
Denham
Pinewood
Gerrards Cross
Chalfont St Peter
Gerrards Cross Golf Course
Bulstrode Park
Bulstrode
Hedgerley
Hedgerley Hill
Hedgerley Green
Hedgerley Park
Hedgerley Lodge
Hedgerley Farm
Hedgerley Cottage
Hedgerley Wood
Hedgerley Common
Hedgerley Pond
Hedgerley Bridge
Hedgerley Mill
Hedgerley Manor
Hedgerley Church
Hedgerley Vicarage
Hedgerley Rectory
Hedgerley Parsonage
Hedgerley Glebe
Hedgerley Tithe Barn
Hedgerley Pound
Hedgerley Stocks
Hedgerley Whipping Post
Hedgerley Village Hall
Hedgerley Recreation Ground
Hedgerley Cricket Ground
Hedgerley Football Ground
Hedgerley Tennis Courts
Hedgerley Bowling Green
Hedgerley Swimming Pool
Hedgerley Allotments
Hedgerley Cemetery
Hedgerley Crematorium
Hedgerley Chapel
Hedgerley Meeting House
Hedgerley Methodist Church
Hedgerley Baptist Church
Hedgerley Congregational Church
Hedgerley Presbyterian Church
Hedgerley Unitarian Church
Hedgerley Quaker Meeting House
Hedgerley Salvation Army Hall
Hedgerley Mission Hall
Hedgerley Sunday School
Hedgerley Infant School
Hedgerley Junior School
Hedgerley Secondary School
Hedgerley Grammar School
Hedgerley Technical College
Hedgerley Polytechnic
Hedgerley University
Hedgerley Hospital
Hedgerley Infirmary
Hedgerley Dispensary
Hedgerley Surgery
Hedgerley Chemist
Hedgerley Post Office
Hedgerley Telephone Exchange
Hedgerley Gas Works
Hedgerley Electricity Works
Hedgerley Water Works
Hedgerley Sewage Works
Hedgerley Refuse Tip
Hedgerley Fire Station
Hedgerley Police Station
Hedgerley Magistrates' Court
Hedgerley County Court
Hedgerley Crown Court
Hedgerley Prison
Hedgerley Workhouse
Hedgerley Almshouses
Hedgerley Orphanage
Hedgerley Asylum
Hedgerley Lunatic Asylum
Hedgerley Idiot Asylum
Hedgerley Deaf and Dumb Asylum
Hedgerley Blind Asylum
Hedgerley Reformatory
Hedgerley Industrial School
Hedgerley Ragged School
Hedgerley Night School
Hedgerley Evening Class
Hedgerley Lecture Hall
Hedgerley Public Library
Hedgerley Museum
Hedgerley Art Gallery
Hedgerley Theatre
Hedgerley Music Hall
Hedgerley Concert Hall
Hedgerley Opera House
Hedgerley Cinema
Hedgerley Dance Hall
Hedgerley Skating Rink
Hedgerley Swimming Baths
Hedgerley Turkish Baths
Hedgerley Gymnasium
Hedgerley Boxing Club
Hedgerley Wrestling Club
Hedgerley Fencing Club
Hedgerley Archery Club
Hedgerley Rifle Club
Hedgerley Shooting Club
Hedgerley Hunt
Hedgerley Kennels
Hedgerley Stables
Hedgerley Riding School
Hedgerley Livery Stables
Hedgerley Blacksmith
Hedgerley Farrier
Hedgerley Saddler
Hedgerley Harness Maker
Hedgerley Wheelwright
Hedgerley Coachbuilder
Hedgerley Carriage Builder
Hedgerley Motor Garage
Hedgerley Petrol Station
Hedgerley Car Park
Hedgerley Taxi Rank
Hedgerley Bus Station
Hedgerley Railway Station
Hedgerley Goods Yard
Hedgerley Coal Depot
Hedgerley Timber Yard
Hedgerley Builder's Yard
Hedgerley Brickfield
Hedgerley Quarry
Hedgerley Gravel Pit
Hedgerley Sand Pit
Hedgerley Clay Pit
Hedgerley Chalk Pit
Hedgerley Lime Kiln
Hedgerley Brick Kiln
Hedgerley Pottery
Hedgerley Glass Works
Hedgerley Iron Foundry
Hedgerley Steel Works
Hedgerley Rolling Mill
Hedgerley Forge
Hedgerley Anvil
Hedgerley Hammer
Hedgerley Tongs
Hedgerley Bellows
Hedgerley Chimney
Hedgerley Flue
Hedgerley Boiler
Hedgerley Engine
Hedgerley Steam Engine
Hedgerley Gas Engine
Hedgerley Oil Engine
Hedgerley Electric Motor
Hedgerley Dynamo
Hedgerley Generator
Hedgerley Transformer
Hedgerley Switchboard
Hedgerley Fuse
Hedgerley Circuit Breaker
Hedgerley Lightning Conductor
Hedgerley Telegraph Pole
Hedgerley Telephone Pole
Hedgerley Electric Light Pole
Hedgerley Gas Lamp
Hedgerley Oil Lamp
Hedgerley Candle
Hedgerley Rushlight
Hedgerley Tallow Chandler
Hedgerley Soap Boiler
Hedgerley Perfumer
Hedgerley Hairdresser
Hedgerley Barber
Hedgerley Wigmaker
Hedgerley Tailor
Hedgerley Dressmaker
Hedgerley Milliner
Hedgerley Hatter
Hedgerley Shoemaker
Hedgerley Boot Maker
Hedgerley Cobbler
Hedgerley Leather Dresser
Hedgerley Tanner
Hedgerley Currier
Hedgerley Fellmonger
Hedgerley Glover
Hedgerley Saddler
Hedgerley Harness Maker
Hedgerley Whip Maker
Hedgerley Umbrella Maker
Hedgerley Parasol Maker
Hedgerley Fan Maker
Hedgerley Toy Maker
Hedgerley Doll Maker
Hedgerley Puppet Maker
Hedgerley Model Maker
Hedgerley Instrument Maker
Hedgerley Optician
Hedgerley Watchmaker
Hedgerley Clockmaker
Hedgerley Jeweller
Hedgerley Goldsmith
Hedgerley Silversmith
Hedgerley Engraver
Hedgerley Printer
Hedgerley Publisher
Hedgerley Bookseller
Hedgerley Stationer
Hedgerley Newsagent
Hedgerley Bookbinder
Hedgerley Paper Maker
Hedgerley Ink Maker
Hedgerley Pen Maker
Hedgerley Pencil Maker
Hedgerley Rubber Maker
Hedgerley Glue Maker
Hedgerley Gum Maker
Hedgerley Varnish Maker
Hedgerley Paint Maker
Hedgerley Dye Maker
Hedgerley Colour Maker
Hedgerley Chemical Works
Hedgerley Drug Store
Hedgerley Apothecary
Hedgerley Druggist
Hedgerley Herbalist
Hedgerley Botanist
Hedgerley Gardener
Hedgerley Nurseryman
Hedgerley Florist
Hedgerley Seedsman
Hedgerley Corn Merchant
Hedgerley Miller
Hedgerley Windmill
Hedgerley Watermill
Hedgerley Millstone
Hedgerley Millwright
Hedgerley Millpond
Hedgerley Millrace
Hedgerley Millstream
Hedgerley Millhouse
Hedgerley Millcottage
Hedgerley Millfarm
Hedgerley Millyard
Hedgerley Millgate
Hedgerley Millroad
Hedgerley Millpath
Hedgerley Millbridge
Hedgerley Millford
Hedgerley Millbrook
Hedgerley Millstream
Hedgerley Millpond
Hedgerley Millrace
Hedgerley Millwheel
Hedgerley Millshaft
Hedgerley Millgear
Hedgerley Millstone
Hedgerley Millwright

but the goods which they consume; whereas nearer the centre the goods are carried by road. They do, in point of fact, encourage residential traffic of this description. For example, the London and South Western Railway Company have lately taken a new departure by issuing third class monthly season tickets between Waterloo and practically every important suburban station, including places as far distant as Weybridge, 19 miles, Chertsey, 22½, and Woking, 24½, at prices approximating to the total cost of daily workmen's tickets during the same period, with the additional advantage of being available by any ordinary train, instead of being restricted to trains arriving before 8 a.m. or leaving after 6 p.m. It may be mentioned in this connection, that some railway companies in Ireland give free season tickets for a limited time to the occupiers of new houses of a certain rateable value built near their lines.

Volume of suburban traffic carried by railway.

It is difficult to ascertain how many people travel daily between London and the suburbs, as the railway companies do not make separate returns of suburban passengers. By the courtesy of the companies, who have been good enough to furnish me with definite information on this point, I am able to state the number of passengers from all stations within 30 miles of London who entered the central area by railway in the month of October, 1907. Table II., Appendix A, shows the number of ordinary passengers, irrespective of class, who travelled to London in the course of the month from stations in certain zones. The figures include the estimated number of journeys in one direction taken by season ticket holders, but do not include the journeys of passengers who took return tickets in London, nor do they include any journeys between suburban stations. Table III., Appendix A, gives similar information with regard to passengers travelling at workmen's fares.

The figures show that of 9,743,669 passengers who entered London by railway from the suburban districts in the month of October, 1907, 8,071,785—nearly 83 per cent.—came from distances not exceeding 10 miles from Charing Cross, more than 8½ per cent. came from distances between 10 and 12 miles, and less than 8½ per cent. from distances between 12 and 30 miles.

Density of suburban traffic in different zones.

The density of railway traffic in the different zones may be gauged by comparing the number of passengers per square mile. The following table shows in a summary form the total number of passengers who entered London from each zone, the area of each zone, and the number of passengers per square mile:—

Zone.	Distance from Charing Cross.	Area in square miles.	Number of passengers.	Number of passengers per square mile.
	Miles.			
1	4 to 6	63	2,232,201	35,584
2	6 „ 8	88	3,406,588	38,729
3	8 „ 10	113	2,432,996	21,512
4	10 „ 12	138	843,780	6,104
5	12 „ 15	244	238,252	977
6	15 „ 20	560	331,213	592
7	20 „ 25	707	151,025	213
8	25 „ 30	864	107,614	124

The accompanying diagram, which has been compiled by the Ordnance Survey from the information supplied by the railway companies, gives a graphic representation of this traffic, and affords an indication of its volume and distribution. It serves to show, among other things, how unequally the traffic is distributed.

Electrification of Steam Railways.

Considerations which have led to the adoption of electric working.

The expediency of substituting electrical for steam working is a question which has been much debated and is still one upon which there is much difference of opinion both in this country and abroad. The main considerations which have led to the adoption of electricity have hitherto been, either the existence of abundant water power, the objection to the use of steam in tunnels,

or the impossibility of applying it to tube railways. In comparatively few instances was electric traction first adopted in the absence of one or other of these conditions; and in this country the only railway companies which have seen their way to take up the system on its merits are the Lancashire and Yorkshire and the North Eastern, which have both applied it to crowded sections of their lines; the Liverpool overhead railway, worked in connection with the electrified branch of the Lancashire and Yorkshire; the Midland, who have electrified their lines between Lancaster, Heysham, and Morecambe; and the London Brighton and South Coast, who are making active progress with the electrification of the South London line between Victoria and London Bridge. The total route mileage of electric railways, exclusive of light railways, in the United Kingdom amounted at the end of 1907 to little more than 189 miles of which 108 were in London. (1)

Mileage of electrical railways.

Electrical working in London.

In London, electricity was first employed as the motive power on railways in connection with the tubes, in which the use of steam is inadmissible. This cannot be said of railways like the Metropolitan and Metropolitan District which had been worked by steam power for many years, though here also, as in the case of all underground railways, the superiority of electrical over steam working is sufficiently apparent. Still less can it be said of railways mainly or entirely above ground where no question of ventilation arises; but when it was decided to electrify the Inner Circle, it became necessary for reasons of practical working to extend the system to the branches and lines worked in connection with the Circle, so that electrical has now been substituted for steam haulage on many miles of open railway. The East London Railway alone was omitted from the scheme: steam working was retained; through working with the District Railway, which existed under the old conditions, had to be suspended; and there has been a loss of through traffic in consequence which amounted to more than 37 per cent. in the past year. It is not easy to bring this short railway into a general scheme, as it is leased to six different companies, but there appears to be a general desire that it should be electrified with a view to restore through running, and it is hoped that means will be found to bring about this desirable improvement.

East London Railway.

Inner Circle.

The principal consideration which led to the electrification of the Inner Circle was the increased capacity for traffic which electrical traction affords. The two companies were losing traffic by competition, further competition was threatened, and some means had to be found to increase the earning capacity of the lines and to restore their waning popularity. The only hope of obtaining a return on the heavy capital cost of such lines lay in utilizing their capacity to the fullest possible extent, and this could only be done by the adoption of electric traction. The cost of making the change was heavy, and amounted in the case of the District Railway alone to no less than £1,700,000, but it had to be incurred, and may well be justified by the result. In 1904, the last year of steam working, the Metropolitan Company carried 94,436,498 passengers. In 1906, the first complete year of electrical working, they carried 98,384,768. The corresponding figures of the District Railway were 51,167,792 and 55,062,424, and though it is true that the numbers have since declined, the recent loss of traffic is attributable to other causes and would have been far greater had steam working been continued. It is also true that changes in fares have probably affected the volume of traffic. Fares had been lowered to a point at which traffic became unremunerative. They have since been raised, though not to the level at which they stood prior to 1905.

North London Railway.

What might have happened to the Metropolitan and District Railways, had steam working been continued, may be inferred from the experience of the North London Railway, which operates under somewhat similar conditions. In 1904 the North London Railway carried 22,680,957 passengers, exclusive of season ticket holders. In 1907 they carried 19,725,052, showing a loss in three years of nearly three millions, a loss moreover which is proceeding at an accelerating rate. In the same time the District Railway have more than held their own. The North London lost £53,132 in passenger receipts, while the District gained £31,693. It must also be remembered that the full benefit of conversion from steam to electricity has not had time to make itself felt. The change was a

(1) Appendix B—IV.

large and arduous undertaking from the traffic, as well as from the engineering, point of view, and the working and organization have hardly yet been brought to perfection. As lately as December, 1907, considerable improvements were made in the train service. The number of trains running each way daily on the District Railway was increased on one section from 360 to 437, and on another from 251 to 371 ; during the busiest hours of the day trains now run at intervals of two minutes. These results, which it is only fair to say are partly attributable to the adoption of automatic signalling, could not have been approached under the conditions of steam working, and although their full effect may not be seen for some time to come, it can hardly be doubted that they will result in benefit to the company as well as to the public.

Improvements in the train service.

The following table giving the number of trains run in one direction per day over different sections of the District Railway in December, 1904—the last year of steam working—and in December, 1907, shows the improvements which have been made in the service :—

DISTRICT RAILWAY.

Comparison between Number of Trains run on each Section of Line, December, 1904 (last Steam Year), with December, 1907 (increased Electric Service).

Section.	December, 1904.	December, 1907.	Percentage increase.
Harrow Line	36	49	36
Hounslow Line	38	90	137
Ealing to Mill Hill Park	47	111	136
Mill Hill Park to Turnham Green	64	124	94
Richmond to Turnham Green	27	36	33
Turnham Green to Hammersmith	91	160	76
Hammersmith to Earl's Court	107	235	120
L.N.W.R. (Addison Road to Earl's Court)	35	35	—
Wimbledon to Putney Bridge	51	83	63
Putney Bridge to Earl's Court	97	228	135
Earl's Court to High Street (direct)	43	97	126
Earl's Court to South Kensington	172	328	91
Circle trains from Metropolitan line (at South Kensington)	101	106	5
South Kensington to Mansion House	269	437	62
Mansion House to Mark Lane	228	371	63
Aldgate East to Whitechapel (District trains)	128	263	105
Whitechapel to Bow Road	84	226	169
Bow Road to East Ham	57	152	167

The above figures are for one way only. Corresponding number of trains was run in each case in the opposite direction.

The principal cause of the increased traffic capacity which electrical traction confers is the more rapid acceleration of an electric, as compared with a steam, train. With the former a speed of from 30 to 40 miles an hour is commonly attained in as many seconds after starting, whereas a steam train requires from 60 to 100 seconds to attain the same speed. This power of rapid acceleration materially reduces the time occupied by a journey on a railway with many stations. Mr. Philip Dawson, Electrical Engineer to the London, Brighton and South Coast Railway, anticipates that the electrification of the South London line will shorten the journey time between Victoria and London Bridge from 34 to 24 minutes ; and he believes that the time occupied in travelling from Victoria to the Crystal Palace could be reduced from 43 to 21 minutes if that line were electrified. The advantage of rapid acceleration does not stop here, since the shortening of journey time admits of more trains being run, and thus increases the capacity of the line by admitting of a more frequent as well as a more rapid service. Another advantage claimed for electrical traction is the facility with which trains can be dealt with at terminal stations. There is no attaching or detaching of engines, and no provision need be made for sidings. An electric train draws up to a platform, and remains there only long enough to be emptied and filled. A third advantage is the ease with which the length of an electric train can be varied to suit the requirements

Advantages of electrical working.

of traffic at different times of the day. Composed as it is of motor and trailing coaches, it can be divided or added to with the greatest facility, and in the shortest time possible.

These are the principal points of superiority which the advocates of electric traction claim for their system as compared with steam, but they do not exhaust the list. The electric train consumes no current when at rest, whereas a steam locomotive in service burns fuel, whether at rest or in motion. The power used is in direct proportion to the weight of the train. The cost of electric installation and repairs are said to be slight in comparison with the cost of coal, water, drawing fires, repairs, &c., of steam locomotives; and it is added that a substantial saving in coal may be effected, as a cheaper quality can be used in the generating station than is required for a locomotive. Be this as it may, it is not claimed that electrification reduces working expenses, though recent experience in the United States would seem to point in that direction. What is claimed, and may fairly be held to be established, is that it enables more to be got out of a given railway by admitting of a more frequent and speedy service of trains than is possible under steam conditions. In other words the inducement to a railway to adopt electrical working is the increase of earning capacity, not the decrease of working cost.

Advantage of electric working in the case of urban railways.

It is for this reason that the advantages attending the use of electric power are most marked in the case of urban railways where a frequent and rapid train service is the first consideration. Urban railways differ from suburban lines in this respect that their capital cost is commonly greater in proportion to their length, while their traffic is denser and more continuous throughout the day. It is therefore necessary to make the most of their carrying capacity in order to deal with the traffic, and of their earning capacity in order to obtain a return on the capital sunk in their construction. Their stations are necessarily numerous, and rapid acceleration is of greater consequence than it is on lines with longer intervals between the stations. The traffic on suburban lines is apt to be heavy during the rush hours of the morning and evening, and comparatively light at other times, so that there is less to be gained as a rule in electrifying a suburban than an urban railway.

Electric working adopted under compulsion,

Great as are the advantages of electrical working, it may so far be said to have been adopted in London under compulsion. The tube railways had no choice. It was forced on the Metropolitan and District railways by competition, and they took to electricity lest a worse fate should befall them. The Great Western were driven to electrify the Hammersmith and City line, of which they are joint owners, in order to maintain through working with the Metropolitan.

except in the case of the Brighton Railway.

The London, Brighton and South Coast alone have voluntarily undertaken the electrification of one section of their system, worked under urban conditions, and that avowedly as an experiment. No railway company that was free to choose has hitherto seen its way to electrify suburban lines.

Expense of electrification.

The railway companies, as commercial undertakings, are bound to regard the question from a commercial point of view, and the consideration which naturally weighs with them is whether the advantages of electrification compensate for the cost. The expense of conversion from steam to electricity is heavy, and—unless a railway is so congested with traffic that the limit of its capacity has been reached, and there are good reasons for believing that increased capacity would bring clear gain—there is no inducement to incur the expense, especially at a time when the prospects of railway enterprise are far from encouraging, and capital is difficult to raise.

Opinion of the Royal Commission on electric traction.

The Royal Commission were clearly impressed with the advantage of electric traction. They expressed the opinion "that the introduction of electric traction will lead to a great improvement of suburban and urban railway facilities in London; the speed of all trains worked by electricity, especially those which stop at many stations, will show substantial increase over the speed of steam trains. It will, we believe, also be found that electric traction, apart from its other advantages, will enable railway companies to increase the number of trains working in and out of terminal stations, and thereby add largely to the facilities afforded for suburban traffic. We hope, therefore, that there may be no great delay before the railway companies serving London adopt electric traction for the working of their suburban train service." Report of R.C., I. 159.

Report of R. C., I. 48

Recent changes in suburban traffic of trunk railways.

When the Royal Commission were conducting their enquiry, the suburban traffic of the trunk railways had been growing for many years. They said, "the suburban traffic of the main lines has largely increased since the dates to which we have referred, and has proved a source of difficulty in working them owing to the great cost of increasing the number of tracks and obtaining additional terminal accommodation."

The number of passengers carried by local railways, tramways and omnibuses had also increased very largely; and though a change in the opposite direction with regard to the suburban traffic of the main lines had set in, it had not become so marked as to attract attention.

Falling off of suburban traffic on the trunk railways.

It is not possible to show the exact extent of the falling off by figures, because the railway companies do not make separate returns of their suburban traffic, but it certainly amounts to many millions. The statements of the companies themselves show that in the six months ending 31st December, 1907, five out of the ten main lines having termini in London carried 10,270,000 fewer passengers than they carried in the corresponding six months of 1906, and the decrease has been going on since 1903. The subject is referred to at greater length in another part of this report, which deals with the competition between railways, tramways and motor omnibuses. It is only alluded to here to show that the pressure of suburban traffic on main lines, referred to by the Royal Commission, is considerably less than it was. Had the conditions of 1903 and 1904 continued to prevail, the electrification of suburban lines might well have become a pressing question. But tramway competition has changed the situation. Short distance traffic has been largely diverted from the trunk railways; year by year they carry fewer passengers and there is now no question of providing for expansion. Whether it is worth while to go to the expense of electrification with the hope of recapturing short distance traffic is a question which every railway company must answer for itself. Their circumstances are different, and no general rule would be applicable to all. Some railway experts do not hesitate to say that short distance traffic is unprofitable, and that the trunk railways would be better without it; others, who have seen large sums of money sunk in providing facilities for suburban traffic, are inclined to cling to it as long as it pays the bare expenses of working. If the railways make no change and simply continue the existing service, they must expect to see traffic diminish and receipts dwindle, with little or no reduction in working expenses. The alternatives appear to be either to accept the loss of the short distance traffic or to electrify their suburban lines. To hold their own against the tramways, they must provide a service no less cheap and convenient, and it is doubtful whether in existing conditions such a service could be remunerative enough to yield a return on the outlay which electrification would entail.

Division of suburban traffic between railways and tramways.

When the tramways shall have become fully developed and the potentialities of motor traffic more clearly visible, it will be possible to see what share of the suburban traffic the trunk railways can retain profitably; but until the changes now in progress show signs of coming to an end, the matter must remain more or less in the region of speculation. As far as can be seen at present, the best arrangement would appear to be one which should restrict each means of locomotion to the field which it could occupy without serious rivalry: railways for outer suburban and long distance traffic, tramways for the bulk of short distance traffic, and the more flexible motor vehicles for the remainder. Meanwhile there is little indication of an intention on the part of the railways to have recourse to electrification. The conditions might, however, be altered if a cheap supply of electrical power were to become available, and it is in this direction that there is the best hope of seeing electrical traction applied on a considerable scale to railways in the neighbourhood of London. Cheap electricity might indeed transform the whole traffic problem. It would offer an inducement to the railways, such as does not now exist, to incur the expense of electrification, and possibly to remodel their systems by effecting a complete separation between their suburban and main line traffic; it would enable the facilities for locomotion to be increased to a degree which might have far reaching consequences on the conditions of life of all classes of dwellers in London, and it would tend to diminish overcrowding in the centre by promoting the dispersal of factories and workshops over a larger area.

Cheap supply of electricity might alter conditions.

Present cost of working electrical railways.

In this connection it may be interesting to record that the cost of working electrical railways at the present time, excluding interest on the capital cost of generating plant, has been given by Sir George Gibb at the following amounts :—

	d.	
City and South London	1·22	per car mile.
Great Northern, Piccadilly and Brompton	1·59	„ „
Metropolitan District	1·75	„ „
Charing Cross, Euston and Hampstead	1·76	„ „
Central London	1·83	„ „
Baker Street and Waterloo	1·85	„ „
Great Northern and City	1·95	„ „

The low cost of the City and South London is accounted for by the fact that the cars are smaller and lighter than those on other railways. The high cost on the Baker Street and Waterloo is due to exceptional amount of curvature on the line, and on the Great Northern and City to the large size of the tube and the heavy rolling stock.

Competition between Railways, Tramways and Motor Omnibuses.

Loss of suburban traffic by trunk railways.

The Reports of the Railway Companies having termini in London for the second half of 1907, and the remarks of the Chairmen at the half-yearly meetings contain many references to loss of traffic caused by the competition of tramways and motor omnibuses.

Great Northern.

Lord Allerton, Chairman of the Great Northern Railway, stated(1) that the total decrease of passengers during the half-year in the London Suburban district amounted to 1,337,000, and attributed the decrease partly to competition of tramways and partly to tube interchange. He added that the figures show "that we are justified in attributing this to the competition by tramways so far as the Great Northern Railway is concerned, because the numbers are very large compared with the loss in money, and our investigations show that as regards the particular districts in which the loss is greatest, they are what we call 'passengers between stations.' There is no doubt, I think, that for the time being the transit facilities in the London district have really outrun the requirements."

London and South Western.

Sir Charles Scotter, Chairman of the London and South Western Railway, referred(2) to the competition of tramways, motor omnibuses and motor cars as the most serious thing to be noted in connection with their traffic, and added that they must turn their attention to the development of long distance traffic, which had been done with great success. He stated that in the course of the half-year they had lost 1,328,000 passengers in the London Suburban district, entirely attributable to tramway and omnibus competition.

London, Brighton and South Coast.

Lord Cottesloe, Chairman of the London Brighton and South Coast Railway, stated(3) "that the number of passengers carried was less by nearly a million and a quarter than in the corresponding half-year of 1906, whilst during the whole year there has been a decrease in the number of passengers carried of over 3,300,000. Of this latter decrease, that is to say for the year, no less than two and three-quarter millions is accounted for by the falling off in the number of passengers carried in the suburban area between London, Croydon and Sutton. The decrease in the suburban area is accounted for mainly by the tramway competition." He further stated that "tramway competition in the suburbs of London is increasing rather than diminishing, and the linking up of the lines which now run practically over the whole of South London with the West End and the City, by an extension over Westminster Bridge and the projected extension over Blackfriars Bridge, will make the competition even more severe. It has been pointed out to the proprietors on previous occasions that the difficulty of a railway company competing with Municipal tramways for distances of five or six miles is almost insuperable, either by way of reducing fares or increasing the services."

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(1) 14th February, 1908.
(2) 6th February, 1908.
(3) 5th February, 1908.

Lord Claud Hamilton, chairman of the Great Eastern Railway, stated(1) that with one small exception, every one of the suburban branches showed a decrease, the total decrease in passengers amounting to 4,121,000 in the half-year. He attributed the falling off to the increased facilities on the surface of the streets afforded by electric tram cars and motor omnibuses, and added that he saw no prospect of regaining the traffic. *Great Eastern.*

Mr. Cosmo Bonsor, chairman of the South Eastern and Chatham Managing Committee, mentioned(2) that they had carried 2¼ million fewer passengers during the half-year, nearly all of them in the London suburban districts. He stated that they had "come to recognise the fact that this competition cannot be met by anything that we can do in the way of endeavouring to attract the public back to our trains, and consequently the only way to meet it is by making economies. During the past six months we have considerably reduced the number of trains, picking out those trains which we found were the least patronised, but even with that reduction we find that we have inconvenienced some of our old customers." *South Eastern and Chatham.*

Sir William Hart Dyke, addressing the shareholders of the London, Chatham, and Dover Railway, alluded(3) to the severe competition of the tramways which had seriously injured their short traffic business, and pointed out that outside the competitive area in which they were suffering, there were many attractive residential districts which were only begining to develop. He mentioned the difficulty of closing stations and reducing trains, but added that "these are difficulties we must face in the future unless we go on squandering your revenue on empty trains." He stated that in the year 1903 when tramway competition first affected them seriously, the company carried 75 million passengers, while in 1907 they carried 62 millions. He contrasted the loss of 13 millions of passengers with the comparatively small loss of £8,000 in money, drawing the conclusion that the diminution in short distance suburban traffic was nearly balanced by the increase in long distance traffic, and observed that "we should be unremitting in our efforts to secure a higher class traffic further afield, and a reduction of train mileage where it is totally unproductive." *London, Chatham, and Dover.*

The foregoing references show the magnitude of the loss which some of the trunk railways are suffering. They also serve to indicate the directions in which the companies are looking for remedies. The companies mentioned are the chief sufferers, but all the companies are losing more or less of their suburban traffic, though to some—especially the trunk lines to the North—the loss is less damaging than it is to the Southern and Eastern lines, partly because their suburban traffic is smaller in volume, but still more because it bears a relatively small proportion to their business as a whole. *Loss less in case of some railways.*

The total number of passengers carried by these five railways in the five years 1903–1907 and the corresponding totals of the passenger receipts are given in the appendix(4). It will be seen that three out of the five show large and continuous decreases in numbers from the first to the last year of the series, the other two show slight increases in the last as compared with the first year, but a falling off in 1907 as compared with 1906. Taking the five together, the number of passengers carried in 1907 was less than the number carried in 1903 by more than 34 millions, a reduction of nearly 10 per cent., while a loss of nearly 19 millions, or more than 5 per cent., occurred in the last year. For practical purposes the whole of this loss may be attributed to tramway and motor-omnibus competition. Comparing 1903 with 1906 it will be seen that a loss of more than 15 millions of passengers was attended with a loss of little more than £21,000, while the loss of 19 millions of passengers in the last year was attended with a loss in money of £156,412. These figures seem to indicate that the loss in the first four years was in traffic carried a very short distance, and that the reduction in numbers was almost made up for by *Extent of loss in five years.* *Loss of traffic is increasing.*

(1) 31st January, 1908.
(2) 30th January, 1908.
(3) 4th February, 1908.
(4) Appendix A—IV.

increased length of journeys, while in the last year competition had begun to make itself felt over greater distances, with a much more serious effect on the receipts. This is precisely the result that might be expected to follow from the improvement and extension of the tramway system.

It is clear that the diversion of traffic from the railways has become very large, and that it tends to increase rather than to diminish. The position is evidently one of difficulty and embarrassment to the railway companies. In some cases the short-distance traffic, at the best, is said to be barely remunerative, and if trains are only partly filled, and receipts diminish without any corresponding saving in expenses, the narrow margin of profit will be swept away, and the service will be carried on at a loss. In such cases loss can only be avoided by taking off trains that do not pay their expenses, but this causes a further diminution in passenger traffic, and puts some people to inconvenience. A large proportion of the passenger traffic which the railways are losing is traffic between suburban stations, and the tramways probably take more of this than of the direct traffic between the suburbs and the termini.

Attempt to recapture traffic by electrification.

In one case only is an attempt being made to recapture lost traffic. The London Brighton and South Coast Railway are equipping their South London line between Victoria and London Bridge for electrical traction with the hope of attracting passengers by means of a frequent service which, in point of speed and carrying capacity, will leave the tramways far behind. Should the experiment prove commercially successful, it may be carried further, and other companies may see fit to follow the example. Failing this, the remedy appears to lie in paying greater attention to the development of districts outside the area of competition, by furnishing them with better facilities and quicker access to the centre, and this is the policy which appears to commend itself to some at least of the companies. In present conditions, tramways and motor-omnibuses cannot compete effectively over distances exceeding 5 or 6 miles, owing to their limited speed. Some authorities put the limit higher, but it is safe to say that, for distances of 10 miles and upwards, no tramway can rival the speed and convenience of a railway. At a greater distance than this, tramways have the contrary effect and act as feeders to the railways.

Limit of tramway competition.

Effects of competition on urban and suburban railways.

North London Railway.

The effects of competition are not confined to the trunk lines radiating from London, but are felt equally by urban and suburban lines, and to such the loss is the more serious inasmuch as they cannot look for compensating gains in other directions. Lord Rathmore(1), Chairman of the North London Railway, commenting on the loss of 2,800,000 passengers in the latter half of 1907, said: "All through the last year the number of electric tubes, motor buses and electric tramway cars has increased in all directions, and, as you will realise, this is a most dangerous kind of competition. The County Council electric tramcars are equipped apparently regardless of expense, they follow one another in an almost continuous stream like a moving platform, taking up and putting down passengers at convenient spots, and carrying them for a very considerable distance for the sum of a halfpenny. All this has naturally attracted a great number of passengers who otherwise probably would have travelled by our railway." Further on he continued, "Such competition is most formidable for us, because if we were to attempt to put down our rates to a halfpenny it would simply mean that we should be carrying passengers at a loss."

Great Northern and City, and City and South London Railways.

Some of the underground railways have also suffered from tramway competition, notably the Great Northern and City, and the City and South London railways, but not perhaps to so great an extent as the lines serving suburban districts, because there are fewer tramways in the central area. The competition of motor omnibuses with railways is less apparent, though it must be considerable, especially in parts of London which are not served by tramways. It is most noticeable where omnibuses follow the routes of underground railways.

Central London Railway.

For instance, on the route of the Central London Railway the carrying capacity

(1) 20 February, 1908.

of omnibuses increased by nearly 30 per cent. between the years 1903 and 1908, while the number of passengers carried by the Central London Railway fell gradually from 45,000,000 in 1903 to 43,000,000 in 1906, and to 37,000,000 in 1907. The drop of 6,000,000 in the last year coincided with the greatest development of motor omnibus activity, and may doubtless be attributed largely to this cause. The effect of this kind of competition is well illustrated by a recent example. Early in the present year a line of motor omnibuses began to run in a district served by a railway company, and in the first month the receipts of the company diminished to the extent of £200. In the month of March the loss to the railway company amounted to £800, and another new line of omnibuses reduced the receipts of another branch by £200, making £1,000 in one month, wholly attributed to this form of competition. The receipts of the local tramways are also said to have diminished by £19 during the first week. There is thus a double competition, tramways and omnibuses competing with each other and both competing with the railways. There are signs of uneasiness among tramway-owning authorities at the appearance of a new competitor in the field, depriving them in their turn of some of the traffic which they had drawn away from the railways, and threatening to become formidable, should the mechanical and financial difficulties be so far overcome as to lead to a large development of motor omnibus traffic.

Recent example of competition.

In the case of short journeys the choice of conveyance is partly a question of time and fares and partly one of convenience. Frequent stops make the time occupied by a short railway journey little less than that of a tramway or omnibus journey of equal length, while time is spent in going to and coming from railway stations and in waiting for trains. Moreover, tramway and omnibus fares are, as a rule, lower than railway fares. But apart from these considerations there are conveniences attaching to tramways and omnibuses which railways cannot offer. Cars pass in quick succession, often past the passengers' very door, and they enable him to reach his destination at the hour at which he wishes to arrive, whereas if he travelled by a workman's train he might have to leave his home earlier than would otherwise be necessary. The effect of a new tramway or line of omnibuses in drawing traffic away from a railway is felt immediately and bears witness to the popularity of these conveyances, and to the fact that they meet the needs of the public.

Explanation of diversion of traffic.

The underground railways of London compete to some extent among themselves. The opening of new tube railways affected the Central London, and the opening of the Piccadilly tube caused a loss to the District Railway in the first six months estimated at £22,830.

Competition of electric railways among themselves.

It is evident that the various elements which go to make up the means of locomotion in London, act and react upon each other, and that so complex a system is highly sensitive. The opening of a new railway, the appearance of a new facility, or an alteration in an existing scale of fares, has a general disturbing effect which is immediately reflected in passenger returns and traffic receipts, and months may elapse before the disturbance comes to an end and a position of equilibrium is reached.

Railway system sensitive to change.

The London Passenger Traffic Conference.

In 1907, competition and the cutting of fares had reached a point at which it became necessary to find a remedy for a state of things damaging to all the carrying companies. A conference was formed under the title of the London Passenger Traffic Conference, composed of representatives of the passenger-carrying companies in London, including the motor and horse omnibus companies, for the purpose of conferring in regard to fares, routes, and other matters of common interest. Sir Charles McLaren stated (1) that "the primary object of the conference is to prevent unnecessary competition, and by mutual arrangement to adjust such of the fares as are not at present on a paying

Attempted co-operation.

(1) 29th January, 1908.

basis." He added that "in considering these questions, the conference keeps before it the fact that nothing must be done to in anyway reduce the facilities given to the public, but rather that by arranging through bookings, &c., the public facilities are really increased;" and he concluded by saying, "We have every reason to be satisfied with the progress that has been made, and we feel sure that a great deal more is to be done by the various companies co-operating together for the common good rather than by a system of wasteful competition such as we have had in the past."

Through booking promoted, and steps taken to educate the public in use of underground railways.

The efforts of the conference have resulted in the raising of some unremunerative fares and in through booking arrangements among the underground railways, which have proved convenient to the public and beneficial to the companies. The Central London, for instance, were carrying 10,000 to 12,000 through passengers daily at the end of 1907, and the number was steadily increasing. Concerted arrangements have also been entered into for exhibiting a large combined map and for the gratuitous distribution of small folding maps, as well as for advertising generally, with a view to educating the public to make more use of the inter-communication between the various underground systems. Through bookings have been arranged between stations on the underground railways and suburban stations on the trunk railways, in addition to the arrangements made through the instrumentality of the conference.

Overcrowding.

Over-crowding diminishing on trunk railways and increasing on underground railways.

There is little to be said on the subject of overcrowding except that it has diminished on the trunk railways and shows signs of increasing on the underground lines. Overcrowding would not occur if the traffic were more evenly distributed in point of time. Even in the busy hours in which overcrowding takes place, there are often more seats than passengers. Mr. Gooday, the General Manager of the Great Eastern Railway, stated in 1904 that during the four hours in the morning and four in the evening when traffic is congested, the Great Eastern Railway provided 24,000 more seats than there were passengers on two of their lines. When last counted, in May, 1906, there were 37,000 more seats than passengers on the same two lines in the eight busy hours, and still certain trains were overcrowded, especially the last morning trains arriving before the expiration of the various periods of cheap travelling.

Steps taken to diminish overcrowding.

Some of the railway companies have given what relief they can by lengthening trains and widening rolling stock, but it is difficult to see how overcrowding is to be avoided when more people wish to travel at the same time than a railway can carry. At such times either the trains must be overcrowded or some of the passengers must be left behind, and, as a rule, people themselves prefer the first alternative. In the case of open railways and coaches with side doors, the evil is mainly one of inconvenience, but in the case of underground lines there is an element of danger. The best remedy is to lengthen the trains and provide the fullest possible service at the rush hours; and when this has been done and overcrowding threatens to become dangerous, the only course is to limit the number of people admitted to the platforms—an expedient to which recourse should only be had in the last resort.

Conference on overcrowding.

A conference on this subject, which was attended by the General Managers of the underground railways, was held at the Board of Trade on the 30th March, 1908. Though no definite conclusions were arrived at, it was ascertained that the question was engaging the attention of the companies and that various methods of dealing with it were being tested.

Speed of Trains.

Speed depends on frequency of stops.

The speed of trains on London railways, which varies considerably on different lines, is mainly determined by the frequency of stops. On most of the tube railways, where the intervals between stations are necessarily short, the

average speed is 15 miles per hour, but on the Waterloo and City Railway, where the trains run a mile and a half without stopping, the average speed is 23 miles per hour. Stations on urban railways must be numerous, and it is unlikely that any material increase of speed can be attained on electric railways. Some improvement in this respect may, however, be possible in the suburban services of the trunk lines, either by the adoption of electrical traction, or failing that, by reducing the number of stops. This is a question of railway working with which none are so competent to deal as the railway companies themselves, and it involves economic considerations to which they are fully alive. High speed is much to be desired as a means of promoting the spread of the population by bringing the suburbs nearer to the centre in point of time, and it may well be that the advantages of low rents and healthier surroundings may be cheaply purchased at the price of higher fares for longer journeys if no loss of time is involved. Anything which tends to distribute the people over a larger area benefits the whole community, by giving a wider choice of residence and by lessening the pressure on the congested centre.

Might be increased in some cases.

Fares.

Cheap, and as far as possible, uniform fares are another factor in the problem. They tend to check the migration of people from one part of the town to another, since the ability to move cheaply and rapidly in many directions permits them to enjoy the advantages of settled homes without having to shift their residences in order to follow their work.

Cheap and uniform fares desirable.

Report of R. C., I. 157. The Royal Commission expressed the opinion that "every encouragement should be given to the adoption of a uniform fare of 2*d.* per journey up to the limit which could be reasonably be covered for that fare, and for distances beyond that limit uniform fares, possibly on a zone system basis." They thought it would be an advantage if Local Authorities were enabled, as recommended by the Joint Select Committee of 1901, to make arrangements *Ib.*, 158. with railway companies "whereby in consideration of additional trains being put on, guarantees might be given for limited periods for such minimum receipts per train mile as might be agreed." The same principle might be applied to fares, and local authorities who wished to promote the settlement of workmen in their districts might be empowered to guarantee the railways against loss. Failing some such arrangement, it is difficult to see how uniform fares in all directions could be obtained in existing conditions.

The railways cannot do more than fix scales of fares which will attract the largest number of passengers without being unremunerative. They can only afford to give low fares if their expenses are low. It is, therefore, in the interest of the community that every assistance should be given to railway companies to construct their lines cheaply.

Workmen's fares.

Experts, who have the best means of knowing, assert that workmen in some cases are carried at a loss. Mr. Gooday, the General Manager of the Great Eastern Railway, gave evidence upon this point in 1904. Referring to the trains carrying workmen to and from Edmonton, distant 8¾ miles from London, and Walthamstow, distant 7 miles from London, at a uniform fare of 2*d.*, he stated that the average working expenses per train mile on the whole of the Great Eastern system, which was 30·44*d.* in 1899, had increased to 36·13*d.* in 1902, while the receipts per train mile amounted to 39·2*d.* The cost of working suburban trains, which is greater than the average, was estimated at 43·76*d.* in 1902. Mr. Gooday has now supplemented this evidence by a further statement that the average working expenses per train mile in 1907 was 38·14*d.* over the whole system, and 46·19*d.* on the suburban lines, and he regards these figures as under rather than over the actual cost. In this instance the exceptionally low statutory fares were accepted by the railway company in lieu of an obligation entailing the heavy expense of rehousing population displaced in the execution of improvements, but where such liabilities have not been incurred no railway company could fairly be expected to adopt similar scales.

Effect of exceptionally low fares on district to which they apply.

Mr. Gooday informed the Royal Commission that one result attending the immigration of workmen in large numbers to suburban places is that the more remunerative traffic is driven away, and in proof of this he mentioned that the season ticket traffic has not shown the same expansion at Walthamstow and Edmonton as at other places where very cheap fares are not in operation. He has now given further information on this point shown in detail in the following table :—

INCREASE OR DECREASE IN SEASON TICKETS.

Station.	Class.	1902 compared with 1882.		1907 compared with 1882.		1907 compared with 1902.	
		Increase. Per cent.	Decrease. Per cent.	Increase. Per cent.	Decrease. Per cent.	Increase. Per cent.	Decrease. Per cent.
Walthamstow (3 stations)	1st and 2nd	144	—	132	—	—	5
	1st class only	24	—	—	3	—	21
Edmonton (5 stations) ...	1st and 2nd	17	—	—	9	—	22
	1st class only	—	47	—	62	—	29
Leytonstone (2 stations)	1st and 2nd	303	—	338	—	9	—
	1st class only	171	—	153	—	—	7
Ilford	1st and 2nd	1,615	—	2,268	—	38	—
	1st class only	756	—	972	—	25	—

The traffic originating in the parish of Ilford, where there was one station in 1882 and three in 1902, increased 2,228 per cent. between 1882 and 1902, 3,587 per cent. between 1882 and 1907, and 58 per cent. between 1902 and 1907, the increase of 1st class traffic in the two latter periods amounting to 1,311 per cent. and 36 per cent. respectively.

The table shows that while the season ticket traffic, though somewhat larger than it was in 1882 in places where very cheap fares are given, is now diminishing, it has expanded enormously in similar places where there are no very cheap fares. These fares thus inflict a double loss upon the railway company, driving away the remunerative traffic, and leaving only a traffic which is said not to pay. They have the further effect of attracting large numbers to the favoured localities, and creating congested areas inhabited exclusively by people of the poorer classes. This is an admitted evil, and it can only be cured by making all suburban districts at the same distance from the centre equally attractive. Whether this end can be achieved by railways or by other means of locomotion is comparatively immaterial, but the railways cannot be expected to carry passengers at a loss, unless they receive something in return as the Great Eastern did in the case of Edmonton and Walthamstow.

Fares unduly lowered have had to be raised.

Low fares raise the value of land.

The Metropolitan and District Railways reduced their fares to a point at which they did not pay, and were losing so much money that they were compelled to raise them to a less unremunerative level. The public do not always get the benefit of a reduction in fares. One of its effects is to raise the value of land, and in such cases the traveller may pay as much in increased rent as he gains by the lowering of his fare, the whole benefit going to the landowner.

Agreements between Railway Companies.

Probable effect upon London traffic.

An agreement has recently been entered into between the Great Central and Great Northern Railway Companies, and has since been extended so as to include the Great Eastern. A still more recent agreement has been made between the London and North Western and Midland Railway Companies.

These, and any similar arrangements that may take place, though primarily intended to diminish competition, will undoubtedly have some effect upon London traffic, and the effect will probably be beneficial, by reducing cross traffic, and diminishing the carting of goods and the movement of passengers between terminal stations. It will also diminish the numbers of railway receiving offices which are such a fruitful cause of obstruction in the streets. The alliance between the Great Central and Great Northern Companies has already led to the suppression of six receiving offices.

STEAMBOATS.

Service of steamboats prior to 1905.

Between 1840 and 1876 there were services of steamboats by five different companies which were generally successful. From 1875 to 1896, however, three companies which took up the enterprise become insolvent. The Thames Steamboat Company (1897) Limited, took over the assets of the Victoria Steamboat Company, and continued a service of steamboats. But it was not a success; in 1900 the boats did not commence to run until the middle of June and continued for only three months. Owing to this collapse many of the authorities of the riverside districts urged the London County Council to institute a municipal service. In the following session of Parliament a Bill was introduced for this purpose. On 4th March, 1901, it was read a second time in the House of Commons and referred to a Select Committee, who decided against the Bill. Following upon this, the company's service of steamboats on the river became still more inadequate and irregular. There were sometimes intervals of 50 minutes between boats advertised to run every half-hour. The service was stopped altogether on 16th September, and on the 8th May, 1902, the company announced their decision not to run any boats during the season. In the following year the company did not resume the service, "so that for a space of nearly three years the public were entirely deprived of this means of transit." (1)

London County Council steamboats.

Capital expenditure.

After the unsuccessful attempt of 1901, the London County Council obtained power, by the Thames River Steamboat Service Act in 1904, to establish a service of passenger steamboats on the Thames. The Council purchased 30 boats at a cost including coal hulks and moorings of £216,018, and acquired 27 piers, of which fifteen were transferred from the Thames Conservancy, eight were purchased, and three were built, at a total cost of £85,062, making a total net capital expenditure of £301,080. The service was inaugurated on the 17th June, 1905, and was carried on without interruption until the 2nd October, 1906, when it was discontinued for the winter. The service was resumed in 1907 and continued from 15th May to 31st October. It has not been resumed since and the Council have decided to dispose of the fleet.

Passenger traffic.

Financial results.

In the first few weeks after the opening in 1905 the steamers carried more than 200,000 passengers weekly, but after August the numbers fell off, and in the winter months averaged less than 20,000 per week. The largest number carried in any one week was 292,714 in the week ending 12th August, 1905, and the smallest was 5,248 in the week ending 16th December, 1905. In 1906 the numbers carried were somewhat smaller than they had been in the corresponding periods of the previous year. The total number of passengers carried from first to last was 9,784,251 of whom 398,381 held circular tickets available for return by the Council's tramcars. The total passenger receipts amounted to £79,905, while the working expenses amounted to £152,979 showing a difference of £73,074, from which may be deducted £27,140, the total of amounts recoverable from underwriters, &c., leaving a net deficiency of £45,935 irrespective of interest on the capital represented by the boats. The piers are accounted for separately. The total deficiency appears from the printed statements to have amounted (including interest) to £90,185 in respect

(1) London County Council statement for the inauguration ceremony of the Council's service of steamboats, 17th June, 1905.

of the boats, and £38,131 in respect of the piers, being a total deficiency of £128,316.

Causes of failure.

The financial failure of the experiment was mainly due to the fact that steamboats could not compete in point of speed with the quicker means of locomotion existing on land, and that the river is not conveniently situated, as a thoroughfare, with respect to the population. The steamboats served a useful purpose in conveying pleasure traffic in the summer months, and to some extent as a substitute for ferries. They were also a convenience to people living near the banks of the river, but the traffic was considered too small to warrant the retention of the service, and after much consideration the London County Council decided on the 18th February, 1908, that it must be given up. They are now making arrangements to sell the steamboats and dispose of the piers.

Proposal for a limited service.

Negotiations took place in 1908 for the chartering by a syndicate of seven of the steamboats, with a view to resume a limited service during the summer months, but they fell through, owing to inability on the part of the syndicate to raise the necessary funds.

REGULATION OF TRAFFIC, AND OBSTRUCTIONS IN STREETS.

Summary of Recommendations of the Royal Commission.

Standing of vehicles.

There is no occasion to enter at any length into questions connected with the regulation of traffic, and other matters dealt with in Chapter VIII. of the Report of the Royal Commission, since there is little to add to what has already been said. It may, however, be convenient to summarise the recommendations of the Royal Commission, and to add a few remarks suggested by recent experience. Report of R. C., I. 160.

Under the head of "(*a*) Standing of vehicles at the sides of the streets", the Commission observe that "It is obviously out of the question to attempt to prohibit the practice of standing of vehicles at the sides of streets, either universally or in particular streets. On the other hand, the standing of vehicles for this purpose in crowded and often narrow streets, either continuously, or with only short intervals, seriously impedes locomotion. If there is any doubt about the law, it should be made clear that the use of the streets by frontagers shall only be such as is reasonable, having regard to the convenient use of the streets for general purposes. For example, where the business is of such a nature that the owner practically converts the street opposite his place of business into a private yard, to the serious inconvenience of the general public, we think he might not unreasonably be required to provide a suitable place for loading and unloading; in regard to future buildings this should be made compulsory." *Ib.*, I. 161.

Power to make bye-laws and regulations.

The Commission were disposed to think that power might be given to some authority to make bye laws or regulations on this subject in regard to existing buildings, and they suggested that such power might be given to the Police authorities subject to the approval of the Secretary of State. Each regulation, in common with all other bye laws or regulations relating to traffic, should, they thought, be examined by the proposed Traffic Board, which "after conferring with the local and street authorities concerned, should submit recommendations to the Secretary of State, with whom final approval should rest. Every street and local authority should be authorised to submit to the Traffic Board, for consideration, recommendations affecting street traffic, and the Board should inquire into the recommendations and report upon them to the Secretary of State." *Ib.*, I. 162.

Loading and unloading.

Under the heading of "(*b*) Loading and Unloading of Certain Articles," the Royal Commission observe that the prohibition, by section 15 of the Metropolitan Streets Act, 1867, of loading and unloading coal and casks across the footway within the "special limits" of the Metropolitan Streets Act, 1867, between 10 a.m. and 6 p.m. does not work satisfactorily, nor does it seem expedient to restrict the prohibition to the area known as the "special limits." *Ib.*, I. 164.

They think that "the requirements of the case would be met if the general power to make regulations regarding the standing of vehicles, which we have recommended to be conferred upon the Commissioners of Police, is extended, on the same conditions, so as to enable them to deal with methods and times of loading and unloading." As an alternative they recommend that power to regulate by bye-law hours of loading and unloading should be conferred upon the Corporation of the City of London and the Metropolitan Borough Councils. They consider that coke should be dealt with in the same way as coal in this respect.

Report of R.C., I. 165. Under the head of "(*c*) Waiting of Private Carriages and Other Vehicles," the Commission recommend that authority should be given, by express statutory provision, to any policeman regulating traffic, to require for reasonable cause, the removal of a vehicle or horse to some adjacent portion of the same street or to some neighbouring street indicated by him. *Waiting of vehicles.*

Ib., I. 166. Under the head of "(*d*) Routes for Vehicles," after setting out the provisions of the law relating to the prescribing of routes, which they say have been inoperative; and signifying their general approval of the provision of a Bill introduced by the Secretary of State in 1899, which, however, did not become law; they express the opinion that the Bill should be enacted, though they are not prepared to say that it may not be desirable to extend the limits *Ib.*, I. 167. prescribed therein, either immediately or at some future date. They "attach great importance to the proposed power of regulating the routes of vehicles being placed on a proper footing." *Routes for vehicles.* *Legislation required.*

Ib., I, 168. They draw attention to the fact that omnibuses are specially exempted from the operation of the existing law, but hold that some regulation of routes in their case is essential. Should the objection, which, they understand, is *Ib.*, I. 169. entertained by the Commissioner of Police to the exercise by him of wider, or indeed of any, powers of regulation of the routes of vehicles be held to be well founded, they suggest as an alternative, that power to make bye-laws might be conferred on the London County Council; with the proviso that omnibuses should be exempted from their jurisdiction on the ground that the County Council, who work tramways, have become the trade competitors of the omnibus companies. They recommend in this case that "authority to regulate the routes of omnibuses should be given to some independent person or body, such as the Commissioner of Police, or the proposed Traffic Board." They point out, however, that "such a division of authority would be likely to cause inconvenience, since the best results can only be secured by providing that all routes shall be laid down on a comprehensive plan and by a single authority." Their final conclusion is that a general power of regulating the routes of all classes of vehicles should be conferred upon both Commissioners of Police, subject to the approval of the Secretary of State for the Home Department, and in the case of the Commissioner of the City, to the consent of the Court of Mayor and Aldermen. They add that every proposed bye-law or regulation dealing with the subject should be examined and reported on by the proposed Traffic Board. *Ib.*, I. 170. They mention as a possible objection that, inasmuch as the London County Council takes a leading part in carrying out street widenings and constructing new streets, it would be convenient that the same authority should have the power of prescribing routes for vehicles. They "think that this difficulty might be avoided by leaving the making of regulations in the hands of the Commissioners of Police, and providing that the London County Council, the Corporation of the City of London, and the Metropolitan Borough Councils, should be authorised to suggest to the Commissioners of Police, routes for vehicles, which, after examination by the proposed Traffic Board, might be approved or rejected, or approved on conditions by the Secretary of State." *Regulation of routes of omnibuses.*

Ib., I. 171. Under the head of "(*e*) Special Regulation of Omnibus Traffic," the Royal Commission think it would be desirable that definite powers should be conferred, subject to like conditions, on the Commissioners of Police "to determine the starting places and termini for omnibuses within their respective districts, as well as to make regulations for the preservation of order at such places, and also for limiting the time during which omnibuses shall be allowed to remain at standing or starting places, and for regulating the order of their departure." The powers which the Commissioners already possess within *Fixing starting places and termini of omnibus routes.*

the "Special Limits" of the Act of 1867, might, they think, with advantage be extended to the "General Limits" of the Act.

Breaking up of streets

Under the head of "(*f*) Breaking up of Streets" the Royal Commission state that the complaints of obstruction of traffic from this cause which they had received appeared to be well founded, and that the evil had increased in magnitude in recent years. They give a full statement of the numerous companies and authorities who have power to break up the streets. They point out that *avoided by use of subways.* although subways for pipes and wires would afford an effective remedy, their cost is so great as to prove in many cases prohibitive. Subways, they say, "can, with advantage be constructed, as has been done in the past, where new streets are being made, and old streets widened, or when other favourable opportunities occur, but the remedy is not one that can be applied generally." They refer to a Bill dealing with the subject which was deposited in Parliament by the Corporation of the City of London in 1902, and state that the recommendations which they have to make are substantially in agreement with the provisions of that Bill. They set out these recommendations in detail, and point out that fresh legislation would be required to give them effect.

Report of R. C., I. 172.

Ib., I. 173.

Legislation required.

Ib., I. 175.

Costermongers

Under the head of "(*g*) Use of the Streets by Costermongers and Itinerant Vendors," the Royal Commission mention that there are "about 7,500 costermongers in London, that 142 streets are used by them to a greater or less extent for the purpose of their trade", and that in some instances they cause obstruction. The Commission "hold that the streets are primarily intended for the convenience of traffic and purposes of locomotion, and that the setting up, of what are practically shops, in the roadway, and the transaction of the business of a shop there, are practices which should only be permitted so long as the through or local traffic in the street is not materially affected." They discuss at some length the provisions of the law regarding the use of the streets by costermongers, hawkers, and itinerant vendors generally, and find them obscure and complex; while they pronounce the procedure, in dealing with obstruction, to be tedious and unsatisfactory. "It does not appear to us right," they say, "that questions regarding the propriety of setting up what are, to all intents and purposes, shops in the crowded streets of the Metropolis should be left to be decided by a series of actions in the Law Courts between the Metropolitan Borough Councils and individual costermongers, under a law which is, admittedly, obscure and complex." They add that "The question that ought to be raised, is not whether a particular costermonger is causing annoyance or obstruction, but whether or not a certain street can or cannot be allowed to be used by costermongers for the purposes of their trade, with reasonable regard to the requirements of the travelling public." They think that an amendment of the law should be made in the direction of restoring its provisions to what they were before 1867; "that power should be given to the London County Council and the Corporation of the City of London to regulate and prohibit, by bye-laws, the use of the streets by costermongers or itinerant vendors"; that "all such bye-laws should be considered, and reported on by the proposed Traffic Board"; and that the Secretary of State "should have power to sanction the bye-laws either absolutely or conditionally."

Ib., I. 176.

should only be allowed in the streets in certain conditions.

Obscurity of the law.

Ib., I. 177.

Ib., I. 179.

Law requires amendment.

Ib., I. 180.

Obstruction caused by markets.

Under the head of "(*h*) Special obstructions to Traffic," the Royal Commission refer to such obstructions to the free use of the streets as Spitalfields Market and the Whitechapel Hay Market, and say that "it would be the duty of the proposed Traffic Board to call attention to all causes of obstruction in the streets, and to suggest appropriate remedies." In the particular case to which they refer, they state that according to their information improvements were being made in regard to Spitalfields Market which would remove the grounds of complaint. They think that the hay market should be removed from the Whitechapel High Street.

Ib., I. 181.

Maintenance of the streets.

Under the head of "(*i*) Maintenance of the Streets," the Commission mention several matters "in respect of which the street authorities have been said to be to blame," such as excessive camber of the street surface, excessive watering at the sides of streets, the use of unsuitable material for sanding the streets, the selection of unsuitable material for paving, the placing of rows of lamp-posts or standards down the centres of crowded streets, as well as the placing of public conveniences in places where they unnecessarily interfere

Ib., I. 182.

Fixed obstructions.

with traffic. They are opposed, as a rule, to any direct interference in these matters with the discretion of the local bodies concerned, but they think it would probably have a good effect if the proposed Traffic Board were to make suggestions in reference to them in their Annual Report. They desire, however, to state in the clearest terms that they "consider it of importance that all fixed obstacles or impediments to free and rapid movement in the streets should be removed where possible. In this way not merely will the movement of general traffic in the streets be facilitated, but the necessity for expensive street improvements may, in some degree, be obviated or postponed. We are of opinion that no fixed obstacle to traffic in future should be allowed to be placed in any street without the approval of the proposed Traffic Board."

Report of R. C., I. 183.

Ib., I. 184. Under the head of "(*j*) Subways for Pedestrians," the Royal Commission "do not think such subways would be so generally used as to justify the requisite expenditure," but they add that "the growing congestion of the streets of London, and the probable increase in the number of fast motor vehicles add to the importance of the question." *Subways for pedestrians.*

Ib., I. 185. Under the head of "(*k*) Cutting off of Water Supply," the Royal Commission note the unnecessary disturbance of the streets caused by the cutting off of the supply by the water companies on the occurrence of changes of tenancy. They assume "that under the Metropolitan Water Board there will not be any such ground of complaint." *Cutting off water supply.*

Ib., I. 186. Under the head of "(*l*) Supervision of the laying of Pipes, Wires, &c., in the Streets," the Royal Commission observe that the exercise of supervision by some public authority over the laying of new pipes is becoming a question of importance. "Power should be given to the street authorities to require the owners of dead mains to remove them, if necessary, when laying new ones; and plans should be provided, open to inspection by the public, showing all wires, pipes, and such underground works, laid under each street." They recognise that these matters "have already been dealt with to some extent, and what is now required is the introduction of a definite system, dealing in a complete manner with the whole subject." *Pipes and wires.*

Ib., I. 187. Under the head of "(*m*) Cabstands," the Royal Commission are of opinion "that the Commissioners of Police should periodically review the position of the cabstands, and make such changes as they find desirable and practicable." *Cab stands.*

Ib., I. 188. Under the head of "(*n*) Crawling Cabs," the Royal Commission mention that the question has often been discussed, and that the efforts of the police to mitigate the obstruction caused by loitering have not been altogether without effect. While recognising the evil they do not see their way to recommend any alteration in the existing law. *Crawling cabs.*

Ib., I. 189. Under the head of "(*o*) Slow traffic keeping to the Kerb," the Royal Commission express the opinion that vehicles proceeding at a walking pace "should, in the absence of reasonable grounds to the contrary, be required to keep as close as possible to the kerb." If this rule "could be generally enforced, it would materially relieve congestion in the streets by tending to separate the slow and fast traffic, but owing to the number of vehicles standing at the sides of the streets, it cannot be strictly enforced, and the satisfactory working of the rule will depend on the discretion exercised by the police in enforcing it." There appear, however, to be differences of opinion as to the law on the subject. *Separation of slow and fast traffic.*

Ib., I. 190. The Commission observe that much of the slow traffic consists of "heavy vehicles transporting materials to and from factories and workshops, situated within and adjoining, the central area." They look to the removal of factories to less congested districts as likely to relieve the central streets from much of the heavy traffic. They point out that "the provision of cheap electrical power is a most potent factor in the direction of the decentralisation of manufactories," and they think that "every facility, both legislative and municipal, should be given to that end." *Removal of factories from the central area.*

Ib., I. 191. Under the head of "(*p*) Position of the Great Markets" the Royal Commission allude to this as a matter which seriously affects the traffic question, but "having regard to the repeated failures of attempts that have been made in the past to remove markets, or alter their position," they do not feel "justified in making any recommendation on the subject." *Markets.*

Simplification and consolidation of the law.

Under the head of "(*q*) Simplification and Consolidation of the Law," the Royal Commission recommend "that the law under which traffic in the London Streets is regulated, be simplified and consolidated. At present it is scattered over a series of Acts, the provisions of which are, in some cases obscure; in others, they are inapplicable to present conditions; and occasionally they can only be ascertained as the result of one or more expensive and troublesome law suits." They give various illustrations, and mention that the need for consolidation and simplification has been rendered more urgent by the rapid increase in two new branches of traffic, unknown at the time of the Metropolitan Streets Act, 1867,—tramways and mechanically propelled vehicles—which, as they observe, are placed under the control of separate Departments of State. They mention that bye-laws and regulations relating to traffic are made by, or are subject to the approval of, the Home Office, the Board of Trade, the Local Government Board, the Commissioners of Works, the Ranger of the Park, and the London County Council; and they point out that the natural consequence of such divided jurisdiction between various Departments, who are not bound to confer with each other or with the Commissioners of Police, is that some of the bye-laws overlap, while others are in conflict. Report of R. C., I. 192.

Divided jurisdiction and overlapping authorities.

Regulations and bye-laws should be examined by Traffic Board.

They express the opinion that the legislation which they recommend for the simplification and consolidation of the Statutes regulating traffic in London should provide "that all regulations and bye-laws relating to London traffic, by whatsoever authority they may have been framed, should in the interests of co-ordination, go before the proposed Traffic Board, for examination and report, and especially before final approval, where such is required." *Ib.*, I. 194.

Statute law relating to the Metropolis requires revision.

The Royal Commission add that the question of the simplification of the laws regulating traffic is "only a portion of the general question of the simplification and consolidation of the Statutes relating to local government generally in the metropolis." There is, they say, "no doubt that complexity and obscurity in the Statute law are a serious hindrance to efficient administration generally; and we recommend that the Statute law affecting the Metropolis should be revised and simplified." *Ib.*, I. 195.

Recent experience with regard to obstruction and the need of regulations.

Railway receiving offices.

The obstruction caused by vans standing in the streets at railway receiving offices which has been much complained of will diminish if contemplated working arrangements between railway companies are carried into effect. Six receiving offices have already been suppressed in consequence of the alliance between the Great Central and the Great Northern railway companies.

Regulation of the routes of vehicles, especially motor omnibuses.

The question of the regulation of routes has come into marked prominence since motor omnibuses came into general use, owing to complaints by the owners and occupiers of houses, of noise, vibration, smell, depreciation in the value of property attributed to these causes, and complaints by the road authorities of the damage which motor omnibuses occasion to roads, especially when driven at high speed. These questions were considered in 1906 by the Select Committee of the House of Commons on the Cabs and Omnibuses (Metropolis) Bill. The Committee made the following observations in their Report:—

"In considering this matter and what regulations may be enforced to abate the annoyance and injury, it is desirable in the first place to point out a distinction between different classes of streets. A person taking a house upon a main line of metropolitan traffic must in justice be prepared to tolerate the noise of such traffic, in whatever reasonable manner it may develop. A person, on the other hand, who for reasons of health or the necessities of occupation, takes a house off the line of such main traffic, has a just ground of complaint when the main traffic is diverted to pass his front door for no reason except the profits of private enterprise. The rights of the millions of people who benefit by the increased speed and area of public motor traffic may fairly be regarded as outweighing the increased disturbance, within reason, of those who have elected to reside or carry on business in main thoroughfares. It is, on the other hand, a condition of civilised life in a city that a citizen to whom comparative quiet is essential shall know that by residing in certain places he will be assured of it.

"We are therefore of opinion, in the first place, that a commercial company or a public authority, if such shall hereafter enter this field, should not be at liberty to run motor omnibuses wherever it pleases with entire disregard to the character of the streets traversed. Any person desiring to run motor omnibuses in the metropolis should, in our opinion, supply to the proper authority a map of the route it is proposed that these should follow, and it should not be legal to run motor omnibuses along any route until such route has been approved by the said authority. This recommendation if acted upon will at once remove many grounds of just complaint, while in no way infringing private rights or handicapping commercial enterprise. The stopping places of motor omnibuses at the end of routes should also not be chosen by the omnibus proprietors until after permission granted by the proper authority. This recommendation requires the repeal of a section of the Metropolitan Streets Act, 1867.

"The question whether such authority should be the Metropolitan Police or the County and Borough Councils does not come within the terms of reference to us. At present regulations similar to that we propose are carried out by the Metropolitan Police.

"This regulation will largely meet the complaint concerning the depreciation of property by motor omnibuses. It should also be borne in mind that motor omnibuses, if they depreciate the value of some property, appreciate that of other property by bringing it within the quick and cheap reach of all persons employed in the Metropolis. A depreciation and appreciation of property is also caused by electric tramways. After the enforcement of the above regulation, however, there will remain many grounds of public complaint against motor omnibuses. One of the chief of these is the vibration they cause.

"In some cases we think that the injury alleged to be caused by vibration due to motor omnibuses is in reality due to heavy lorries, traction engines, etc. Persons whose houses are violently shaken sometimes attribute this, without investigation, to motor omnibuses. We are of opinion that heavy, slow moving mechanical traffic crossing the metropolis should be restricted to certain prescribed routes, and should not be permitted to take short cuts through residential districts, or to make use at all hours of crowded narrow thoroughfares in central London."

Destruction of roads by heavy motor traffic.

Another aspect of the question which was brought to the notice of the Royal Commission by several witnesses representing the local authorities has come into further prominence. The construction and paving of many of the streets are not such as to make them suitable for very heavy traffic—especially for heavy vehicles travelling at high speed. The use of such a street by motor omnibuses cuts up the road and puts the local authority to heavy expense for repairs. Roads have been used in this way until they became impassable, and have then been abandoned for others which have been similarly destroyed in their turn. Such abuses inflict hardship on the community, inasmuch as those who cause the damage pay nothing for the use of the roads. If the use of such roads by heavy vehicles is not to be prohibited, a limitation of speed might well be imposed.

Centre lamp-posts.

Report of R. C., VII. p. 65.

The most pernicious of fixed obstructions are centre lamp-posts, and other permanent structures in the roadways. The Advisory Board of Engineers "enter an earnest protest against the placing of lamp or tramway trolly wire standards in the centre of roadways at any point. The practice grew up no doubt from a mistaken idea of facilitating traffic by separating the up and down streams, on the assumption that the up and down traffic is equal in volume. This assumption is true only as an average, for as a fact, the balance is always fluctuating. With the varying pace of vehicles and necessary stoppages the longitudinal occupation of the centre of the road at frequent intervals with standards and their surrounding kerbs is most objectionable, and renders adjustment of pace so difficult that a wide thoroughfare is converted by them into two narrow and inconvenient lanes, which do not admit of the passage of the traffic nearly so well as one unobstructed street."

Obstruction by centre lamp-posts has increased.

Since the publication of this emphatic warning, centre lamp-posts have been erected throughout the entire length of one at least of the busiest metropolitan thoroughfares, diminishing its effective capacity by an amount which is certainly large, and has been put as high as twenty-five per cent. Centre lighting is said to be cheaper than lighting from the side, but any saving that

can be effected in this way is dearly purchased at such a price. An objection to centre lamp-posts not mentioned by the Advisory Board is that they serve as refuges and so tempt pedestrians to cross at a much larger number of points than is necessary. Refuges must of course be provided, but the needless multiplication of crossing places, and the consequent occupation of the roadway by pedestrians is embarrassing to vehicular traffic, and a danger to the people themselves.

Centre lighting without lamp-posts.

The centre lighting of streets has been accomplished in the City of London, in Berlin, and probably elsewhere, in a wholly unobjectionable manner, by the simple expedient of suspending the lamps from chains or wires stretched from one side to the other, but the method is not applicable to very wide streets.

Refuges.

Refuges are more necessary in wide than in narrow streets, yet they are often to be found in the latter and not in the former. To take two familiar instances of busy streets, Pall Mall with a roadway 40 feet wide has no refuges between the two ends, while Bond Street, which is much narrower, has several. At and near the junction of Bond Street, and Brook Street five refuges may be seen within a few yards of each other in streets of such moderate width that refuges would hardly seem to be required, and many similar instances may be seen all over London. If the requirements in this respect were investigated, with due regard to the volume of traffic and the width of streets, it would probably be found that new refuges ought to be provided in some places, while existing refuges might be dispensed with in others. The Advisory Board of Engineers considered that refuges should be placed further back than they are at present from the points of intersection of streets.

Need for refuges should be investigated.

Report of R. C., VII. p. 65.

Other fixed obstructions.

Other obstructions of a permanent character such as lavatories, statues, obelisks, fountains, and lamp pillars of unnecessary size, are mentioned by the Advisory Board. They are often so placed as to offer impediment to free movement, and when the existence of such obstacles cannot be justified on grounds of public convenience or embellishment, they ought to be removed.

Ib., VII. p. 65.

Small improvements might facilitate locomotion,

If a systematic survey were made of every crowded thoroughfare, and consideration were given to every addition, however small, that might be made to the capacity of the street by such means as the removal of obstacles in the roadway, the removal of railings and other projections which encroach upon the footways, the better apportionment of the total width between roadway and footways, and the rounding off of the corners of foot pavements at street junctions, it might be found possible to effect, at small cost, a large number of trifling improvements, which, though scarcely noticeable individually, would yet in the aggregate add appreciably to the facility of locomotion. Such measures could, however, only be looked to as affording some degree of temporary relief, and could not be regarded as a substitute for street widening, which, as a rule, is the only effective and final remedy.

but would not obviate necessity for widening.

Maintenance of roadways:

The Select Committee on Cabs and Omnibuses made the following remarks on the subject of the maintenance of roadways. "But even if noise be in large part suppressed, and heavy mechanical traffic confined to main routes, the chief cause of vibration will still be untouched, and nothing will remedy it except improved road surfaces in the Metropolis. So long as our streets are full of holes, so long injurious vibration must be caused by heavy vehicles. A weight of a ton and a half on one wheel of a laden motor omnibus, not falling by gravity, but driven downwards by a powerful spring, into a hole half an inch or more deep, delivers a most powerful blow that cannot fail to set up serious vibration. The most expert witness before us, Mr. Worby Beaumont, technical adviser to the Commissioner of Police, declared (Q. 2,976) that 'until road maintenance receives proper and intelligent attention, and until it is recognised that a road surface should be watched from the time it is made, and the proper mending done, vibration to roads and houses will result.' That view we accept, and therefore the chief cause of excessive vibration after the elimination of undue noise cannot, in our opinion, be attributed to motor omnibuses but to the unsatisfactory and multifarious road methods of the many local Metropolitan Authorities."

might form the subject of special inquiry.

This finding suggests that some better method should be adopted for the maintenance of important thoroughfares which traverse the areas of two or more local authorities. The upkeep of such thoroughfares is a matter of more than

local concern and is of such importance to the whole community that the expediency of carrying it out in a more efficient manner is a question which might well form the subject of special enquiry.

Effect of motor traffic on paving of streets.

The effect of motor omnibus traffic upon different kinds of paving has been reported upon by the Metropolitan Committee on Materials and Means of Paving the Streets of London. Their fifth Annual Report, issued in February, 1908, contains a number of reports from engineers and surveyors of Metropolitan Local Authorities. They concur generally in the opinion that motor omnibus traffic is very destructive to macadamized roads, but that it is not injurious to wood pavement or asphalt if the foundation of concrete is sufficiently thick. The dropping of oil is, they say, damaging to asphalt paving, but this ought not to occur if proper precautions are taken.

Improvements in formation of macadamised roads.

Tar has been applied in various ways to macadamized roads, and many experiments have been made with a view to improve the surface, and to minimise the nuisance of dust. Though they have not been uniformly successful, there is reason to hope that means will be found to improve the construction of roads in regard to their growing use for motor traffic.

Crawling cabs.

Obstruction caused by crawling cabs will diminish as motors supersede horse-drawn cabs. The driver of a motor cab pays for the petrol which he uses, and it is not in his interest either to consume fuel in perambulating the streets, or to travel at the slow pace of a horse cab moving at a walk. The motor cab proprietors discourage crawling on account of the wear of tyres and machinery.

Effect on traffic of substitution of mechanical for horse vehicles.

The supersession of horse drawn by mechanical vehicles which is going on benefits traffic directly and indirectly. A mechanical vehicle occupies the streets less than a horse vehicle because it is shorter and travels faster. The number of horses in London has diminished by many thousands, the consumption of forage has been largely reduced, and there is in consequence less carting than there was of hay, straw, and manure through the streets. Motor traffic causes no dirt. The gradual supersession of horses promotes cleanliness and ought to reduce the expenses of scavenging and cleansing of roadways.

Relief of congestion by taking traffic off the streets.

Underground railways.

Telephones.

Congestion of traffic can be relieved by diminishing the volume of surface traffic as well as by adding to the capacity of the streets. Much has already been done to take traffic off the streets—notably by the construction of underground railways. The use of the telephone, which has now become general, has affected traffic by diminishing the occupation of the streets by messengers. Had these facilities not come into use, the volume of traffic could not have grown to its present dimensions without unbearable pressure on the accommodation of the streets. Something more might be done in this direction by

Pneumatic tubes.

such methods as the provision of a system of pneumatic tubes for the conveyance of parcels. Much relief would be afforded if means could be found

Markets

to deal with metropolitan markets by increasing their number, and placing new markets in convenient situations with regard both to railway goods yards and to the areas of distribution. The Advisory Board of Engineers drew the attention of the Royal Commission to this point, but they recognised that the question was one of great difficulty. Markets in relation to traffic have hitherto been regarded from the point of view of the direct physical obstruction which they occasion. Their positions, however, promote congestion in another way, namely, the occupation of the streets by slow-moving vans and carts, both full and empty, passing between markets on the one hand, and market gardens, railway goods yards, and retailers' shops, on the other. Much of this occupation of the streets might be avoided if markets were more numerous and better situated. The difficulty of dealing with this question is largely due to the existence of vested interests, but partly to the fact that new markets do not, as a rule, become popular unless they come into use spontaneously.

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R. C., VII.
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CONCLUSION.

The effect of recent changes upon the recommendations of the Royal Commission.

Recapitulation of recent changes.

In the three years which have elapsed since the Royal Commission completed their enquiry, many changes have taken place, some of which were foreseen by them and were foreshadowed in their Report. It may be convenient

to recapitulate the most important of these changes, and to consider to what extent they affect the recommendations of the Royal Commission. They comprise the opening for traffic of 26½ miles of new tube railways; the substitution of electrical for steam working on 68 miles of railway; improvements in railway working; the reconstruction of 28½ miles of horse tramway for electrical working in the administrative County; (1) the construction of 80 miles of new electrical tramways in the outer area; the connection of detached tramway systems north and south of the Thames; the opening for traffic of Vauxhall Bridge and Rotherhithe Tunnel; the completion of Kingsway, Aldwych and other new streets; the widening, partly or wholly accomplished, of Piccadilly and other important streets and roads; the institution and subsequent abandonment of a passenger steamboat service on the Thames; the introduction of more than a thousand motor omnibuses, and a still larger number of motor cabs; a rapid growth in motor traffic generally, and a corresponding diminution in horse traffic; a large increase in the traffic of urban railways, tramways, and omnibuses; and a considerable falling off in the suburban traffic of the trunk railways—a falling off, moreover, which is likely to continue.

In Greater London as a whole, population has increased with unabated rapidity; it has continued to diminish in the centre, and to increase in the outer area; movement has increased in a much higher ratio than population; the demand for locomotion facilities is becoming constantly greater, though for the moment it has been more than met in the central area. Concurrently with these changes, railway enterprise in London, which had been abnormally active, has received a check from which it shows no signs of recovering: while on the other hand the provision and improvement of tramway facilities has made and is making steady progress, though not to the extent, or altogether in the direction, advocated by the Royal Commission.

Conclusions of the Royal Commission as to means of locomotion.

In the summary of the their conclusions which they give at the end of their Report they say: "Increased modern means of locomotion and transport are much needed both to facilitate movement within the central area, and to facilitate access to and from and within the suburbs for those who work in London and live outside. Electric tramways and railways are necessary for both these purposes, tramways mostly for the former, and railways mostly for the latter, with inter-connection between the two." Report of R. C., I. 216

Recent developments.

While the experience of the last three years bears out the general conclusion that additional means of locomotion are much required, especially for the second of the two purposes mentioned by the Royal Commission, it is to be observed that so far, developments have not proceeded on the lines which they contemplated. Tramways are finding a large field of usefulness in carrying passengers in and out between the centre and the outskirts, and are drawing suburban traffic away from the trunk railways, while electric railways and omnibuses are carrying a large proportion of the central urban traffic. It is also to be observed that although the new facilities, which have come into existence since the Royal Commission reported, have gone far to satisfy the requirements of the central area, if indeed they have not more than met them for the time being, it can hardly be doubted that the demand will soon overtake the existing supply. This is certain to occur when better means of communication are provided between the centre and the outskirts, since improved access will bring more people to the centre, and stimulate movement within the central area. It follows that the facilities for getting about from one part of London to another must keep pace with improvements in the facilities for moving in and out.

Extension of the tramway system.

The Royal Commission continue: "The tramways system of London is disconnected and insufficient; it should be largely extended, and the portions of the tramway system that are now isolated should be linked together, through communication being provided from east to west and from north to south." Some progress has been made in this direction, for instance, a line of tramway has been carried across Westminster Bridge and along the Victoria Embankment; one line of through communication by tramway has been provided from *Ib.*, I. 216.

(1) Of this $2\frac{3}{16}$ miles were electrified by companies owning tramways within the County; the remaining 26¼ miles were converted to electrical working by the London County Council.

north to south; isolated portions have been linked together by the tramway over Vauxhall Bridge; another connection will be made when the widening of Blackfriars Bridge is completed; and probably a third over Kew Bridge. But there is no sign of an intention to undertake tramway construction in the centre of London on a scale such as the Royal Commission evidently had in mind. They say: "We believe that much could be done in tramway development without having recourse, at any rate in the first instance, to great and costly street improvements, but as such improvements are unavoidable in any case, the preference should be given to those which will facilitate the extension of the tramway system." This recommendation now appears to be especially applicable to streets radiating outwards from the centre. The existing conditions of traffic in the crowded central thoroughfares, is hardly such as to warrant the expectation that tramways could be laid in them without extensive widening, and of this there is at present no visible prospect. The expense of widening central thoroughfares on a great scale would be enormous, and it does not therefore seem likely that any general widening of streets in the central area, sufficient to admit of the introduction of tramways, could be carried out for some time to come.

not proceeding in the centre of London.

Report of R.C., I. 216.

Recommendation as to street widening specially applicable to radiating streets.

Early widening of central thoroughfares not likely to be undertaken.

Ib., I. 216. Again: "We desire to draw special attention to the importance that urban railways, traversing London from side to side, on routes where there is a heavy traffic, should have four lines of way, in order to provide a separate service for fast and for stopping trains, and thus admit, by means of a few interchange stations, of rapid transit to the suburbs from all the stations on the local lines." This is a counsel of perfection, most desirable if it could be carried into effect, but one that involves the duplication of existing railways, or the construction of new railways with four tracks. There is at present no apparent probability that works of such magnitude will be carried out by private enterprise; indeed, the Metropolitan District Railway Company have abandoned the duplicate deep level line, which they had power to construct, on the ground that it would not pay. The idea of a fast and slow service could perhaps be realised to some extent by working railways, tramways and omnibuses in combination.

Recommendation of the Royal Commission that urban railways should have four lines of way.

Unlikely to be carried out at present by private enterprise.

Ib. I. 216. The Commission proceed: "Owing to the high capital cost of tube railways, constructed under present conditions, there is a difficulty in providing a sufficient number of such railways to distribute population over the outlying districts, but we are advised that it is possible to construct a cheaper type of deep level railway adapted for suburban traffic, with fewer and less expensive stations, and rising to the surface when the open country is reached; such railways would help to solve the housing problem by carrying the population to districts not yet built over." This valuable suggestion has been public property for more than three years, but no such railway has yet been promoted, nor is there any immediate prospect of the suggestion being acted upon. The construction of several new railways has indeed been authorised, an extension of time for construction has in one case been granted by Parliament, and all the authorised lines would be of unquestionable value if they could be made. It is entirely a question of money, and so far the capital has not been raised.

Suggested cheap construction of railways

has not been adopted.

Ib., I. 216. The Royal Commission contemplated that "if private enterprise will not construct the necessary railways, the local authorities might be authorised to give assistance in view of the fact that rehousing within the central area involves a heavy loss to the rates, and that it may be cheaper, and will be better in other respects, to help in making healthier residences in the suburbs accessible." No action has been taken on this suggestion, which would of course require legislation.

Suggestions of the Royal Commission that local authorities should assist the construction of railways has not been acted upon.

In considering these questions it must be borne in mind that the only tube railways in operation up to the year 1905—namely, the City and South London, the Waterloo and City, and the Central London had all been fairly successful. There had been a fierce contest among promoters seeking powers to construct new railways, great results were expected to follow the electrification of the Metropolitan and District Railways, there was much need of facilities for locomotion within and without the central area, and the ability of tramways to meet the requirements of suburban traffic had not been fully tested. These

Considerations pointing to need for increase of railway facilities.

considerations pointed to railways as the best means of providing for the radiating traffic between the centre and the outskirts, and there was no reason to apprehend that capital for their construction would not be forthcoming. The anticipations of three years ago have not been fulfilled. While, on the one hand, the financial results of the working of the new tube railways has been disappointing, and the effect of electrifying the old underground railways has not come up to expectation, on the other, the electric tramways have proved that they are capable of carrying a large volume of suburban traffic, and of competing successfully with railways to a limited extent. They can be constructed at a cost which admits of a fair return on the capital outlay, and if the roads in which they are placed were widened, tramcars might run at speeds little inferior to the speed of suburban railway trains. The cost of widening radiating roads in the outskirts and making new roads on which tramways might be laid would be much less than the cost of constructing railways of any kind, and would bear no comparison with the cost of widening streets in the central area. For these reasons tramway extension on a large scale, coupled with the unification of the tramway systems and the removal of obstacles to through running, seems at present to offer the best practicable means of dealing with the dense suburban traffic up to a distance of 8 or 10 miles from the centre of London. Outside the 10 mile limit there is a wide field open to the Trunk railways, in which tramways could not compete effectively for through traffic, and would probably act as feeders to the railways. Meanwhile, it would appear that the traffic of the central area might be largely left to underground railways and omnibuses.

Anticipations have not been fulfilled.

Existing conditions seem to point to tramways and wider radiating roads.

With the exception of the changes referred to above, nothing of any moment has occurred in the course of the last three years to weaken or disturb the recommendations of the Royal Commission. The general situation is substantially the same as it was in 1905; the evils which their report discloses, though temporarily mitigated in some respects, remain unchecked and unabated, and the need for remedies is as great as it was, if indeed it is not greater.

Situation is practically unchanged.

The Traffic Board proposed by the Royal Commission.

The Royal Commission recognised the existence of special difficulties due to the changing conditions of the problem of London traffic. "In the absence," they say, "of a central body possessed of wide jurisdiction and authority, there existed a fundamental difficulty which could not be overcome by the appointment of temporary Royal Commissions or Select Committees of Parliament. It would have been possible, at any particular date, to draw up a general scheme for street improvements, and the provision of facilities for locomotion and transport, and the financial difficulties in the way of carrying it out could have been overcome by legislation providing for assistance from municipal funds; but even if any such general scheme had been devised, it would probably have been out of date before it was completed, and no permanent body existed which could modify it from time to time, in accordance with the ever changing conditions of the problem."

Report of R. C., I. 200

Central authority necessary in view of changing conditions.

The main result of their labours was a unanimous recommendation that an authority or tribunal should be established, clothed with special powers in regard to traffic questions in and around London. They found that—

Ib., I. 197.

Unanimous recommendation as to necessity for a Traffic Board.

(1) "No general and systematic improvement of the streets of London has ever been attempted, and the works carried out have not been sufficient to meet the ever growing wants of the population."

(2) "Railways of all classes have been practically left to private promoters, subject to such regulation as could be enforced by the intermittent control of Select Committees of Parliament."

(3) There is no co-ordination of the tramways worked by the London County Council with those in other counties or with the tramways owned by Companies, "and the construction of tramways on an adequate scale has been impeded by the exercise of the local veto, while the narrowness of the streets constitutes an obstacle to their extension so as to provide through communication."

(4) "The construction and maintenance of the main roads leading out of London have never been properly controlled or regulated."

They consider that "under such conditions the best results could not be obtained," and they attribute the existing difficulties largely "to the non-existence in the past of some central authority with jurisdiction over a wide area, endowed with ample powers and charged with the duty of looking after the interests of London." They refer to the opinions expressed by Committees of the Houses of Parliament and Royal Commissions appointed from time to time to deal with special questions, all pointing to the need of systematic control, and state that "no adequate remedy for the evil has ever been devised, and no steps have been taken which could be fairly described as more than temporary palliatives." They add that "no local authority exists, or has ever existed, possessed of such jurisdiction and power as to enable it to deal with locomotion and traffic as a whole." They draw special attention to the fact that the problem is continually changing, and that continuous attention to it is essential. While, they say, "it is necessary that the provision of means of locomotion and transport should be carried out in accordance with a comprehensive plan, it is equally necessary that the plans should be modified from time to time to meet the changing requirements of the population, and make use of the latest scientific inventions. Under these circumstances the only effective remedy appears to us to be the creation of a permanent authority, possessed of special knowledge and experience, and giving continuous attention to all questions affecting locomotion and transport in London." In their opinion the present system has failed.

eport of t. C., I. 199.

No existing authority competent to deal with locomotion as a whole.

b.,

b., I. 200.

Traffic Board the only effective remedy.

The Royal Commission then give their reasons for believing that the general control of measures affecting locomotion and transport in London, as well as power to carry them out, cannot be delegated to any existing local or municipal authority, to a representative authority created for the purpose, or to a nominated body. "It seems to follow," they say, "that the only course remaining is to establish a central body, limited in its powers and duties, so as to avoid interference with the functions of existing local authorities."

Control of traffic cannot be delegated to any existing authority.

Ib., I. 201.

Ib., I. 202.

They then proceed to define the powers and duties of the Traffic Board whose creation they recommend.

Suggested powers and duties of the Traffic Board.

The Board should, they think,—

(1) Make a yearly report to Parliament on locomotion, transport and traffic in Greater London, dealing with the whole subject.

Ib., I. 203–205.

(2) Undertake the preliminary examination, before consideration by Parliament, of Bills seeking statutory powers for the construction or extension of works affecting the means of locomotion and transport in Greater London.

Ib., I. 206.

(3) Prepare schemes for works for or in connection with the provision of means of locomotion or transport, if required to do so by His Majesty's Government, or by a local authority with the approval of His Majesty's Government.

(4) Report specially and advise on any question affecting London traffic or locomotion that might be referred to it by His Majesty's Government.

(5) Consider and report to the confirming authority on all bye-laws or regulations for the control of street traffic or the prevention of obstruction in the streets, and make suggestions for their improvement and modification.

(6) Report on any questions affecting locomotion or traffic within the area under the control of a local authority or other public body, at the request of the authority, with the previous approval of His Majesty's Government.

(7) Report on the improvement of the main roads leading out of London.

(8) Report on the building laws as affecting districts not yet built over within the area of Greater London.

(9) Report on the revision and amendment of the laws regulating the breaking up of the streets.

(10) Report on the consolidation and amendment of the laws affecting traffic.

(11) Inquire into and determine any difference of opinion between local authorities regarding their respective contributions to a public improvement, or to the division of any charge between them, on the application of either party. Report of R.C., I. 207.

(12) Hear and determine disputes relating to through running, or the interchange of traffic on or between railways and tramways, or as to bye-laws, whether between local authorities or private companies.

(13) Determine such matters as Parliament should think fit to assign to it, especially with reference to disputes arising in connection with the construction and working of tramways and railways after they have been authorised by Act of Parliament.

(14) Facilitate and suggest amalgamation or joint working of railways and tramways under suitable conditions. *Ib.*, I. 208.

(15) Render services in connection with the abolition of the veto in the case of tramways. *Ib.*, I. 209.

List of duties not exhaustive.

In indicating in general terms the nature of the duties which they think the Board could perform, the Royal Commission strongly deprecate the idea that the list is exhaustive. "Experience and further consideration," they say, "will doubtless show that other duties may with advantage be added to those which we have mentioned, and we think that if found necessary, the constitution of the Board should be modified from time to time." *Ib.*, I, 210.

Board might develop and be required to undertake new duties.

Again, "the Board should grow and be developed as further experience and changing circumstances may show to be necessary. If, for example, it is decided hereafter to carry out an important urban railway at the cost of London, the Board might be required to undertake such duties in connection therewith as are performed by the Rapid Transit Railroad Commissioners of New York City, or the Rapid Transit Commission of Boston; or, if at any time found expedient, it could exercise such powers of supervision over the working of railways and tramways as are given to the Boards of State Railroad Commissioners of New York and Massachusetts."

Decisions of the Board would be subject to Parliamentary control.

The Commission were not prepared to recommend that the decision of the Board on proposals for providing additional means of locomotion and transport in London should be final. It was their opinion that the authority of Parliament, as a safeguard and final Court of Appeal, should be retained. They, however, express the hope that the Board "would secure the confidence of the public, and would come in time to be regarded by all concerned with such confidence that, in the majority of instances, its conclusions would be generally accepted." *Ib.*, I. 211.

Functions of the Board, advisory and semi-judicial.

The functions of such a Board as the Royal Commission recommend, are, they say, "of an advisory and semi-judicial character, and do not, as outlined for the present, involve the exercise of executive or legislative authority; still less do they involve the power of raising money by taxation in any form." *Ib.*, I. 212.

Suggested constitution of the Board.

They are of opinion that "the Board should consist of a chairman and not more than four nor less than two other members," and they "prefer that there should not be more than three members in all" . . . "No member of the Board should engage in any business, or have any interests which might conflict, or appear to conflict, with the proper discharge of his official duties; nor should he be a member of any local authority in London, or have any occupation which would limit the time which he could devote to the work of the Board."

Suggested mode of appointment.

The members should be "specially selected by His Majesty's Government and be paid such salaries as are sufficient to secure thoroughly competent men" . . . "The first members of the Board should be named in the Act providing for its constitution and prescribing its functions."

Attitude of the Board towards authorities and others.

Finally, the Royal Commission contemplate that the Board would maintain a friendly attitude towards all the authorities, companies, and persons with whom it is brought into relation, that it would endeavour to reconcile conflicting interests, facilitate co-operative action, and be ready to act as arbitrator. *Ib.*, I. 214.

Staff.

"It should be given such a staff as experience may show to be necessary for the proper discharge of its duties."

Suggested mode of meeting the expense of the Board.

The Commission consider that the cost of the Board and its staff could be partly met by charging fees in connection with its duties. Any excess to be levied rateably from the local areas within its jurisdiction. *Ib.*, I. 215.

Up to the present no legislation has been passed establishing a Statutory Traffic Board in accordance with the above recommendations. Such steps as have been taken by the Board of Trade are described in the Prefatory Note.

Detailed enquiries recommended by the Royal Commission.

Report of R. C., I. 3.

Necessity for further inquiry on special subjects.

At the outset of their report, the Royal Commission expressed the view that such a question as the best means of locomotion and transport in London "should be considered in the first instance on broad and general lines, and that, subsequently, a series of separate and distinct enquiries should be undertaken in order to deal with particular branches of the subject." Acting on this view, they confined themselves to the broad aspects of the problem, leaving special branches for future consideration, and passing them by with little more than an indication of the need for the detailed investigations which they were unable to undertake themselves.

The following subjects are mentioned as calling for special enquiry.

Ib., I. 68. (1) The preparation of a general plan.

Ib., I. 84. (2) Proposals submitted to them by the Advisory Board of Engineers for widenings and improvements.

Ib., I. 86 and 87. (3) The building laws applying to Greater London.

Ib., I. 89. (4) The main roads leading out of London.

Ib., I. 103. (5) The selection of routes for tramways.

Ib., I. 112. (6) The expediency of the working of large tramway systems by municipalities.

Ib., I. 132. (7) Questions relating to the need for additional railway accommodation and facilities.

Ib., I. 144. (8) The choice between various methods of providing railway accommodation.

Ib., I. 150. (9) Proposals for construction of underground railways under royal parks or property or tramways across or along roads in the same.

Some of these matters are specifically mentioned as proper subjects for enquiry by the Traffic Board. It would doubtless be desirable that the same body should take part in all special enquiries relating to London traffic, as such matters are so closely related to each other, that their consideration can be undertaken best by a body possessing a general knowledge of the whole subject.

Further inquiries arising out of recommendations as to changes in the law.

Other enquiries would doubtless be required should it be decided to give effect to the recommendations of the Royal Commission in regard to the numerous changes in the law which they consider necessary or desirable. The matters in relation to which amendment of the law is, in their opinion, required are :—

Ib., I. 32. (1) Extension to the London County Council of the powers conferred upon the City Corporation and the Metropolitan Borough Councils by Michael Angelo Taylor's Act.

Ib., I. 84. (2) Prevention of the creation of obstacles to the future widening of streets.

Ib., I. 86 and 87. (3) Amendment and unification of the building laws.

Ib., I. 11. (4) Simplification and amendment of procedure for obtaining powers for the construction of tramways.

Ib., I. 115 and 116. (5) Abolition of the veto exercisable by local and road authorities and by frontagers, under the provisions of the Tramway Act, 1870, and the standing orders of Parliament.

Ib., I. 150. (6) Grant of wayleaves to the promoters of tube railways subject to payment for structural damage.

Ib., I. 146. (7) Power, in certain circumstances, to railway companies to buy land by agreement over and above land required for purposes of construction.

Ib., I. 151. (8) Power to the London County Council to acquire land in connection with railways which they may assist in constructing.

Ib., I. 158. (9) Power to local authorities to guarantee receipts to railway companies in respect of additional trains in certain conditions.

Ib., I. 160, 161, and 166. (10) Remedy of defects found to exist in the Metropolitan Streets Act, 1867, and removal of doubts and ambiguities in Section 11 of the Act, and in Section 54 of the Metropolitan Police Act, 1839.

(11) Power to the Metropolitan Police in regard to the removal of horses and vehicles from one position to another in the streets. — Report of R.C., I. 165.

(12) Power to the Commissioners of Police in regard to the regulation of the routes of vehicles, and the making of special regulations in regard to the routes of omnibuses. — *Ib.*, I. 166, 167, 168, 169, and 170.

(13) Power to the Commissioners of Police to determine starting places and termini of omnibuses, and to make regulations. — *Ib.*, I. 171.

(14) Power to street authorities in regard to the breaking up of streets, and removal of doubts in regard to the powers of the Corporation under Section 133 of the City of London Sewers Act, 1848. — *Ib.*, I. 173, 174, and 175.

(15) Clearing up of obscurity and complexity of the law regarding the use of the streets by costermongers, hawkers and itinerant vendors, and bestowal of power on the Corporation of the City and on the London County Council to regulate and prohibit such use. — *Ib.*, I. 177, 178, 179, and 180.

(16) Prohibition of any fixed obstacle to traffic in the streets without the approval of the Traffic Board. — *Ib.*, I. 183.

(17) Power to street authorities to require owners of dead mains to remove them when laying new ones. — *Ib.*, I. 186.

(18) Removal of doubts as to the law in regard to slow traffic keeping to the kerb. — *Ib.*, I. 189.

(19) Simplification and consolidation of the law in regard to the regulation of traffic. — *Ib.*, I. 193, and 194.

(20) Revision and simplification of the statute law affecting the Metropolis. — *Ib.*, I. 195.

Some of these subjects might be considered together.

These numerous recommendations are mentioned in the order in which they occur in the Report. Many of them refer to the same or similar subjects and could doubtless be considered together. These, and the other subjects mentioned before, would require minute and prolonged investigation, which might, if thought desirable, be undertaken by Parliamentary, Departmental, or other Committees specially appointed for the purpose. There would, however, be obvious advantages in entrusting them to a single body, familiar with all the details and aspects of the traffic problem, and with their interdependence upon each other.

MEMORANDUM BY THE HOME OFFICE.

This Memorandum relates to the matters which are referred to in Chapter VIII. of the Report of the Royal Commission on London Traffic and includes notices of all important alterations which have been made in laws and regulations affecting these matters from the date of that Report till the end of the year 1907; it includes also notes of Reports made to Parliament by the Home Office on provisions in Private Bills affecting traffic in the Metropolitan Police District.

Consolidation of the law.

I. It has not been found possible to introduce into Parliament a measure for the simplification and codification of the law under which traffic in London is regulated. The urgent need of such codification, as explained in paragraphs 192–3–4 of the Report of the Royal Commission, is fully appreciated by the Secretary of State and he has been in communication with the Parliamentary Draughtsman on the subject; but owing to the claims of more pressing subjects upon the attention of Parliament legislation on this subject has been impracticable.

Report of R.C., I. 192–94.

Public Bill legislation.

II. The most important legislative enactment touching street traffic has been the London Cab and Stage Carriage Act of 1907 (7 Edw. 7, c. 55) which has dealt with certain of the recommendations of the Royal Commission and of the Select Committee on Hackney Carriages of 1906.

The chief provisions of this Act are here summarised :—

Section 1 enables the Secretary of State to fix fares for cabs fitted with taximeters with a minimum fare of 6*d.* per mile. This section removes the doubts which existed as to his powers to fix fares for taximeter cabs and as to the extent of the limitations thereon imposed by earlier statutes.

Section 2 abolishes the system of "privileged" cabs at Metropolitan Railway Stations. The abolition is however subject to suspension or modification by the Secretary of State, and being admittedly of a temporary and experimental character, it is limited to two years, *i.e.*, until 1st January, 1910.

Section 3 enables the Secretary of State to apply all or any of the provisions of the Acts relating to stage carriages to such carriages as on every journey go to or come from some place outside London. The stage carriages in question have heretofore been exempt from these provisions under s. 2 of the London Hackney Carriage Act of 1843 or s. 5 of the Metropolitan Public Carriage Act, 1869.

Section 4 empowers the Commissioners of the Metropolitan and City Police to regulate the stopping places for stage carriages in London: thus giving effect to the recommendation in paragraph 171 of the Report of the Royal Commission.

Ib., 171.

Section 5 applies the enactments relating to stage carriages in London to carriages used on any street in London by virtue of an order under the Light Railways Act, 1896, in like manner as to tramcars under the Tramways Act, 1870.

New Order of Secretary of State.

In consequence of the passing of the above Act the existing Order of the Secretary of State made under the Metropolitan Public Carriage Act, 1869, was revised and replaced by a fresh Order dated 30th December, 1907; and a series of Orders was made under section 2 with respect to "privileged" cabs.

The effect of the Orders relating to "privileged" cabs may be very briefly given. Exclusive "privilege" of cabs has been abolished at all the great central termini of railways running into London, and at Vauxhall and Clapham Junction stations. Subject to the regulations made by the companies

for the preservation of order, all licensed cabs are now admitted in their turn to such stations on payment of 1*d*. The Secretary of State has suspended the operation of the section in regard to all other stations in London.

The operation of these provisions is being carefully watched by the police, the railway companies, and the representatives of the cab drivers. It is too early to express a final opinion on their expediency; the question of the retention or modification of the Act and the Orders made in pursuance of it will have to be considered in the autumn of 1909.

The chief novel provisions of the Order of the Secretary of State, dated 30th December, 1907, which relate to traffic and to the convenience and safety of hirers and the public, are the following :—

Paragraph 14.—In pursuance of section 3 of the Act of 1907 the provisions of all Acts and Orders relating to stage carriages are applied to all carriages running on tramways or light railways, and to all omnibuses, char-à-bancs, wagonettes, &c., plying for hire, four-horse stage-coaches being alone excepted.

Paragraph 18.—Drivers' and conductors' licences are made revocable by the Commissioner of Police in the event of the holder becoming unable to exercise his calling without risk to the public.

This enables the Commissioner to deal with cases of defective vision, physical feebleness, recklessness, and other causes of public danger, as well as with cases of lapse into drunken or criminal habits.

Paragraph 30.—Drivers and conductors must at all times during employment carry a copy of their licence.

The main object of this is not only to provide for speedy identification, but also to put an end to the practice of borrowing badges, and using out-of-date badges by means of which many unlicensed and unfit persons were enabled to drive public carriages without detection.

Paragraph 29 makes it an offence for a driver to drive a carriage of a type other than that specified in the licence; *e.g.* for a man licensed to drive a horsed cab to take upon himself to drive a motor cab without having been duly authorised so to do on proof of his qualifications.

Paragraphs 39 and 40 require every motor cab to be fitted with a taximeter, and allow *any* cab to be fitted with a taximeter approved by the Commissioner.

Schedule K fixes the fares for motor cabs fitted with a taximeter according to a scale which depends on a combination of time and distance, the fare rising at the rate of the distance run while the cab is progressing at ordinary speeds, and in the ratio of the time which elapses while it is at rest or progressing at a slow rate.

Schedule L fixes a lower scale on similar principles for horsed taximeter cabs.

Private Bill legislation, 1904–1907.

III. The Secretary of State has from time to time drawn the attention of parliamentary committees to proposals in tramway and other Bills promoted by local authorities and private companies which have appeared likely, in the opinion of the Commissioner of Police, to increase the difficulties of regulating street traffic. The chief proposals on which such action has been taken have been as follows :—

Tramways over Thames bridges.

1. Tramways over Westminster and Blackfriars Bridges.—The London County Council (Tramways) Bill of 1905 proposed that the Council's tramways on the south side of the river, which at that time terminated in York Road and Blackfriars Road, should be extended over Westminster Bridge, along the Embankment, and over Blackfriars Bridge. The new tramway was also to connect with an existing tramway in Stangate, and to join near Waterloo Bridge another tramway which was to be brought through the subway (previously authorised) from Southampton Row to the Embankment. The Home Office laid before Parliament the views of the Commissioner of Police, who pointed out that the passage of tramcars from Westminster Bridge on to the Embankment would add to the obstruction of traffic which even then occurred in Bridge Street, owing to the quantity of heavy and slow-moving traffic approaching or coming from the Bridge, and

Report of R.C., I. 103 108, 111.

might at times block the approaches to the Houses of Parliament; that the extension of the tramways in Stangate would cause similar, though less frequent, interruption to the traffic coming north over the Bridge; and that the tramcars emerging from the subway near Waterloo Bridge would render the Embankment less available for general traffic. At the request of the House of Commons Committee to which the Bill was referred, the Commissioner attended before them and explained his views more fully. After taking a considerable amount of evidence, the Committee passed the Bill, subject to a condition that Blackfriars Bridge should be widened. The Bill, however, failed to pass the House of Lords.

The extension of the tramways over the Bridges was again proposed in the London County Council (Tramways) Bill of 1906, and this year passed both Houses of Parliament. The House of Commons Committee, however, after consultation with the Home Office and the Commissioner of Police, inserted special provisions for the regulation of the traffic. These provisions (1) empower the Commissioners of the Metropolitan and of the City Police to suspend the tram service on occasions of State or days of specially congested traffic, subject to the approval of the Secretary of State; (2) empower the Commissioners to appoint stopping places for tramcars on these lines (*see* remarks in paragraph II above, as to effect of sec. 4 of the London Cab and Stage Carriage Act of 1907); (3) require that no car shall stop on the bridges or within certain distances of the bridge-ends; (4) required the exits from the tramway subway on the Embankment to be so constructed as to afford the police an unobstructed view of cars approaching the Embankment.

Report of R.C., I. 103, 104.

Tramway down Tottenham Court Road.

2. Tramway down Tottenham Court Road.—It was proposed in the London County Council (Tramways and Improvements) Bill of 1904 to continue the existing tramway in the Hampstead Road along Tottenham Court Road to Oxford Street. The proposal to have a terminus at the junction of Tottenham Court Road and Oxford Street was open, in the opinion of the Commissioner of Police, to considerable objection. The following extracts from the report made by the Home Office to Parliament on this Bill embodied the Commissioner's views:—

Ib., 58.

"The Commissioner of Police reports to the Secretary of State that a stopping place near the 'Horse Shoe' Hotel at the southern end of Tottenham Court Road, where it joins Oxford Street, would cause serious obstruction and be a source of danger. The road is a very busy one, with much carriage and heavy traffic, including a large omnibus service. According to a return which has been prepared by the police, the number of vehicles that passed the 'Horse Shoe' Hotel, where the tramway terminus would be situated, between 8 a.m. and 12 midnight on the 5th of January last was 9,377, and the traffic would, of course, be very much heavier during the London season.

"The Commissioner also points out that Tottenham Court Road at its northern end is only 46 feet wide, with a large underground lavatory in the centre, and is of opinion that a tramway at this point would cause great delay and render the traffic, already very heavy and difficult of regulation, almost unworkable.

"The view which has been submitted by the Commissioner of Police to the Royal Commission is that the actual terminus of a tramway where the reversing of the car and the loading and unloading necessarily takes place should not be in or at the point of junction with an arterial thoroughfare already full of other traffic. The arrangements to be made to avoid this must, of course, depend on the circumstances of each particular case. At some places, the tramway termini could be made to take the form of a loop, one portion being in a side and relatively not busy street, so that the return journey could be made without reversing the car, and loading and unloading could take place without hindrance to traffic using the main thoroughfare and without danger to passengers attempting to enter the tramcars. Such an arrangement now exists at Hammersmith Broadway. In other cases the difficulty might be met by placing the terminus at a short distance from the point of junction. The ideal arrangement, though in most cases it would be too expensive to be insisted on, would be that the cars should arrive in and depart from a yard corresponding in effect to a railway terminus."

A tram terminus unsuitably placed causes the utmost hindrance to traffic, and great difficulties have been experienced by the police in the regulation of the traffic at some of the existing termini which have been selected without any consultation with the police, and entirely without reference to their suitability as regards the general traffic.

The proposal was rejected by the House of Commons.

Tramways down the Edgware Road.

3. Tramways down the Edgware Road to the Bayswater Road.—The London County Council's Tramway Bills of 1904 and 1906 contained proposals for a tramway along the Edgware Road to the Bayswater Road, with a terminus near the Marble Arch. On both occasions, the Secretary of State laid before Parliament a report giving the views of the Commissioner of Police as to the effect which the proposal to place the terminus at the junction of the Edgware Road and the Bayswater Road would have upon the traffic at that point. The police already experience very considerable difficulty there, owing to the enormous amount of traffic passing east and west, or going into or coming from the Edgware Road, especially during the London season, when the Marble Arch entrance to the Park is largely used by private carriages; and the Commissioner was of opinion that, if a tramway were to pass down the Edgware Road and terminate at the junction with the Bayswater Road, these difficulties would be much increased, and serious obstruction would be caused. He suggested that, if the proposal for a tramway along the Edgware Road was sanctioned by Parliament, either the tramway should stop some distance short of the junction, or the terminus should assume the form of a loop, returning through a less busy thoroughfare, and so enabling the passengers to alight from and mount the cars in a less congested area.

Report of R.C., I. 103, 104.

Ib., I. 58.

The proposed tramway was disallowed in 1904 by the House of Commons Committee, in consequence of a failure to comply with Standing Orders; and in 1906 it was withdrawn at an early stage.

Tramway in Rye Lane.

4. Tramway in Rye Lane.—In connexion with provisions as to the working and construction of a tramway in Rye Lane, which appeared in the London, Camberwell, and Dulwich Tramways Bill of 1904, the Commissioner reported that Rye Lane, which is the market street of Peckham, would require to be considerably widened throughout its length in order to make it a suitable tramway route, and that the establishment of a separate terminus at the High Street end of Rye Lane, which seemed to be contemplated, would cause considerable obstruction to the traffic at that point. The Home Office report suggested that Parliament should only allow the provisions in question (1) if satisfied that the widenings of the lane proposed by the Bill were fully sufficient to prevent any danger or serious obstruction to the ordinary traffic; and (2) that proper provision was made for preventing obstruction at the High Street end.

Ib., I. 58.

The provisions in question never came under discussion as the preamble of the Bill was found to be not proved.

Tramways at Leyton.

5. Tramways at Leyton.—The Leyton Urban District Council Bill of 1904, which authorised the construction of certain tramways, contained proposals (1) to authorise the running of cars of more than the maximum width allowed by the Tramways Act; (2) to enable the tramways to be used for the carriage of animals and goods; and (3) to empower the Council to fix stopping-places for the cars—a power at present exercised by the Commissioner of Police throughout the Metropolitan Police District under the general law. The Home Office reported against these provisions as tending to aggravate the obstruction to traffic which, in view of the narrowness of the streets, would in any case result from the running of the cars. All the provisions in question were omitted from the Bill.

Tramway at Croydon.

6. Tramway at Croydon.—In connection with a proposed tramway in the Croydon Corporation Bill of 1905, the Commissioner of Police reported that the portion of Church Road from Westow Street to the Crystal Palace Parade, along which the tramway was to be laid, was narrow, and that it was questionable whether, without being widened, it was suitable for a tramway route. He also pointed out that the proposed tramway would terminate in the Crystal Palace Parade at a point where the Urban District Council of Penge were intending to bring tramways from Anerley Road, and the convergence of

termini might result in obstruction and accident. His views were laid before Parliament in the Home Office report, but the tramway in question was not proceeded with.

Byelaws under the Municipal Corporations Act.

IV. Certain byelaws affecting traffic are from time to time made by county councils and municipal corporations under their powers of making byelaws for good rule and government, and for the prevention and suppression of nuisances, under section 23 of the Municipal Corporations Act, 1882, section 16 of the Local Government Act, 1888, and section 5 of the London Government Act, 1899, *e.g.*, byelaws as to lights on vehicles, hooded vans, &c. No such byelaw, however, was made for any part of London during the period covered by this Memorandum.

Report of R.C., I. 163.

Costermongers and other itinerant vendors.

Ib., 176–180.

V. The recommendation contained in paragraph 180 of the Report of the Royal Commission to the effect that power should be given to the London County Council and the City Corporation to regulate and prohibit the use of streets by costermongers and itinerant vendors has remained without effect. It was contemplated that regulations so made should be reported on by the Traffic Board and confirmed by the Secretary of State.

The practice remains as described in the Commission's report: police action is confined to cases where there is actual obstruction involving the stoppage of traffic; it is left to borough councils to take action in their discretion when nuisances or annoyance to the inhabitants arises. Prosecutions have taken place in Bethnal Green, Limehouse, Hammersmith, and other localities, and penalties have been inflicted; while in many instances streets have been cleared of street vendors by the action of the local authorities without recourse to law.

Other matters.

Ib., 161. VI. No legislation has taken place affecting—

Ib., 164. (*a*) the standing of vehicles at the sides of streets;

Ib., 166. (*b*) the loading and unloading of casks and other articles;

Ib., 172. (*c*) the prescription of routes for vehicles, including omnibuses;

Ib., 181. (*d*) the breaking up of streets;

Ib., 189. (*e*) special obstructions caused by markets;

Ib., 171. (*f*) the keeping of slow traffic to the kerb;

(*g*) the special regulation of omnibus traffic;

as to which recommendations were made by the Royal Commission (*see* pp. 79–91). And the inconvenience and dangers pointed out by the Commission still remain, save in so far as the points (*a*) and (*g*) have been met by the power to fix stopping places for omnibuses, conferred on the Police by the Cab and Stage Carriage Act of 1907.

Public carriages.

VII. The number of cabs and stage carriages licensed in the Metropolitan Police District shows a slight increase (54) in 1906 as compared with 1905, and a slight decrease (161) in 1907.

Motor public carriages.

VIII. The marked feature of the traffic of London in these years has been the increase of mechanically propelled as against horse vehicles, and this change shows itself conspicuously in public carriages. Thus in 1906 there was a net decrease of 840 horse-drawn licensed vehicles, and in 1907 a net decrease of 1,582 as compared with the previous years; while in mechanically propelled vehicles (licensed) the increases were 891 and 1,421 respectively. Mechanical traction is thus replacing horse traction of public vehicles to a large extent.

The substitution of motor for horsed omnibuses has been marked. In 1905, 3,484 of the latter were licensed as against 241 of the former; in 1907, the numbers were 2,557 as against 1,205. This great change has not been accomplished without considerable dissatisfaction at certain of its accompanying features. Complaints have been loud as to the dangerous speed, the noise, the offensive droppings of grease and the exhaust discharges of these vehicles, and the damage and discomfort caused by the vibration due to their passage, especially over narrow, rough and ill-maintained roads. Representations to the Secretary of State and the Police Authorities have been made repeatedly and energetically by local authorities, associations of private persons, and by aggrieved individuals; and, although there has been progressive improvement in all these respects, complaint has by no means ceased. The facts and figures given in the Annual Reports of the Commissioner of Metropolitan Police show that the Police, both as licensing authority and as

responsible for the management of traffic, have acted within the limits of their powers with the utmost energy and have endeavoured to eliminate the causes of complaint so far as their authority extends.

In 1907, 297 motor omnibuses presented for licence were rejected, a very high standard being insisted on by the special Committee of three persons (not attached to the Public Carriage Department) appointed by the Commissioner to advise him in this matter. And in 8,508 instances motor omnibuses were, under the strict supervision and inspection which prevails, reported to be "unfit" after licensing, and were the subject of a notice "not to use till fit." Many of the vehicles were thus reported several times.

The same strictness is applied to the licensing of drivers of motor public carriages, every candidate who is known to be addicted to drink or to have been guilty of reckless driving being rejected. Notwithstanding these precautions proceedings were found necessary and were taken in several hundred cases of dangerous driving.

The number of fatal street accidents in 1907 attributed to motor omnibuses was 35 as against 14 attributed to horsed omnibuses. The number of non-fatal accidents by which persons were injured was :—Motor omnibuses 1,108, horsed omnibuses 460.

It is noteworthy that notwithstanding the frequent complaints as to danger arising from the speed of motor vehicles, no application in pursuance of the existing Acts has been made by Local Authorities for the reduction of the speed limit in the crowded parts of the Metropolis since the publication of the Report of the Royal Commission in 1905, up to the end of 1907.

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APPENDIX A.

I. Table showing the number of passenger journeys on London electric railways for the years 1903–1907.

II. Table showing the number of ordinary passengers who travelled to London by railway in the month of October, 1907, from suburban stations within certain distances from Charing Cross.

III. A corresponding table showing the number of passengers using workmen's tickets during the same period.

IV. Table showing the total numbers of passengers carried by certain railways, exclusive of season-ticket holders, and receipts from those passengers for the years 1903–1907.

V. Table showing the mileage of tramways in Greater London on 31st December, 1907, and estimated amount of completed track by 31st December, 1908.

VI. Table showing density of population and variations of rent in different parts of the County of London and certain Outer Districts.

APPENDIX A—I.

Number of Passenger Journeys on London Electric Railways for the Five Years 1903 to 1907.

Railway.	Numbers of Passengers carried in					Total.
	1903.	1904.	1905.	1906.	1907.	
METROPOLITAN (*a*) ...	94,000,150	94,436,498	95,694,616	98,384,768	96,859,108	479,375,140
METROPOLITAN DISTRICT (*b*)	50,089,571	51,167,792	51,548,417	55,062,424	51,235,557	259,053,761
METROPOLITAN AND METROPOLITAN DISTRICT CITY LINES AND EXTENSIONS. (*c*)	1,436,055	1,325,241	1,112,422	850,310	549,134	5,273,162
CITY AND SOUTH LONDON	19,622,512	19,128,833	18,765,760	19,648,122	22,208,781	99,374,008
CENTRAL LONDON	44,953,988	44,875,547	44,731,501	43,057,997	36,907,491	214,526,524
WATERLOO AND CITY ...	5,320,597	5,402,782	5,421,238	5,342,213	5,132,298	26,619,128
GREAT NORTHERN AND CITY. (*d*)	—	8,821,289	14,911,017	15,989,668	15,812,609	55,534,578
GREAT NORTHERN PICCADILLY AND BROMPTON. (*e*)	—	—	—	806,130	25,868,538	26,674,658
BAKER STREET AND WATERLOO. (*f*)	—	—	—	9,806,171	20,599,871	30,406,042
CHARING CROSS, EUSTON AND HAMPSTEAD. (*g*)	—	—	—	—	10,302,823	10,302,823
TOTALS	215,372,873	225,157,982	232,184,971	248,947,788	285,476,210	1,207,139,824

(*a*) The figures are from the Company's reports. They include season-ticket journeys, and also passengers who travelled partly over the Metropolitan and partly over a Joint Line; but they do not include passengers who travelled exclusively over a Joint Line.

(*b*) The figures are from the Company's reports. They include season-ticket journeys, and also passengers on the Ealing and Fulham extensions; but not the local passengers on the Richmond extension, nor passengers passing over a small piece of the District Line at Whitechapel, who are included with the City Lines and Extensions in the figures which follow next.

(*c*) From the Board of Trade Railway Returns; 600 journeys being reckoned for each season-ticket.

(*d*) Opened February 14th, 1904.

(*e*) Opened shortly before the end of 1906. The branch between Holborn and the Strand was opened 30th November, 1907.

(*f*) Section between Baker Street and Westminster Bridge Road was opened 10th March, 1906; Elephant and Castle station opened 5th August, 1906; sections to Edgware Road and Lisson Grove, March, 1907.

(*g*) Opened 22nd June, 1907.

APPENDIX A—II.

Number of Ordinary Passengers who Travelled to London by Railway in the month of October, 1907, from Suburban Stations within certain distances from Charing Cross.

Railway.	4 to 6 miles.	6 to 8 miles.	8 to 10 miles.	10 to 12 miles.	12 to 15 miles.	15 to 20 miles.	20 to 25 miles.	25 to 30 miles.	Totals.
GREAT EASTERN ...	229,464	1,091,986	495,036	161,911	55,233	13,899	7,769	Nil	2,055,298
LONDON AND SOUTH WESTERN.	141,301	120,710	750,203	143,674	29,911	85,842	12,273	13,468	1,297,382
MIDLAND	59,976	54,470	5,503	Nil	12,877	33,113	14,759	20,624	201,322
LONDON AND NORTH WESTERN.	Nil	Nil	14,168	21,270	13,149	22,537	3,783	3,655	78,562
GREAT CENTRAL ...	Nil	Nil	5,247	12,370	12,400	7,081	4,854	5,029	46,981
GREAT WESTERN ...	Nil	79,167	83,114	26,389	11,841	31,584	21,571	30,835	284,501
LONDON, TILBURY AND SOUTHEND.*	2,544	45,449	55,057	Nil	2,508	19,322	16,165	6,868	147,913
GREAT NORTHERN ...	631,684	202,572	101,306	65,923	5,679	8,755	4,942	11,838	1,032,699
LONDON, BRIGHTON AND SOUTH COAST.	357,291	258,373	81,790	150,103	14,312	14,183	11,736	4,085	891,873
METROPOLITAN ...	94,184	25,372	Nil	42,291	8,185	5,085	1,142	2,546	178,805
METROPOLITAN DISTRICT.	97,872	143,298	24,547	12,592	Nil	Nil	Nil	Nil	278,309
SOUTH EASTERN AND CHATHAM.	228,656	330,730	304,167	84,801	47,867	55,644	51,358	7,847	1,111,070
TOTALS	1,842,972	2,352,127	1,920,138	721,324	213,962	297,045	150,352	106,795	7,604,715

* There is a daily traffic from Leigh (34 miles), Westcliff (36 miles), and Southend (37 miles), which is reckoned at 125,602.

APPENDIX A—III.

Number of Passengers using Workmen's Tickets who Travelled to London by Railway in the month of October, 1907, from Suburban Stations within certain distances from Charing Cross.

Railway.	4 to 6 miles.	6 to 8 miles.	8 to 10 miles.	10 to 12 miles.	12 to 15 miles.	15 to 20 miles.	20 to 25 miles.	25 to 30 miles.	Totals.
GREAT EASTERN ...	48,215	410,600	146,384	25,165	Nil	Nil	Nil	Nil	630,364
LONDON AND SOUTH WESTERN.	53,963	46,363	54,858	35,934	11,239	15,245	Nil	Nil	217,602
MIDLAND	13,533	23 484	18	Nil	355	271	Nil	47	37,708
LONDON AND NORTH WESTERN.	Nil	Nil	3,057	8,196	4,089	11,740	160	72	27,314
GREAT CENTRAL ...	Nil	Nil	3,707	2,833	Nil	Nil	Nil	Nil	6,540
GREAT WESTERN ...	Nil	2,120	2,218	706	300	821	513	700	7,378
LONDON, TILBURY AND SOUTHEND.	21,293	260,665	157,279	Nil	Nil	Nil	Nil	Nil	439,237
GREAT NORTHERN ...	64,989	35,378	12,464	15,494	Nil	1,645	Nil	Nil	129,970
LONDON, BRIGHTON AND SOUTH COAST.	65,468	99,051	38,121	8,294	299	Nil	Nil	Nil	211,233
METROPOLITAN ...	35,683	21,952	Nil	11,461	83	1,023	Nil	Nil	70,102
METROPOLITAN DISTRICT.	33,972	36,898	2,650	6,117	Nil	Nil	Nil	Nil	79,637
SOUTH EASTERN AND CHATHAM.	52,113	118,050	92,102	8,256	7,925	3,423	Nil	Nil	281,869
TOTALS... ...	389,229	1,054,461	512,858	122,456	24,290	34,168	673	819	2,138,954

APPENDIX A—IV.

Table showing Total Numbers of Passengers carried by certain Railways, exclusive of Season-Ticket Holders, and Receipts from those Passengers for the Years 1903 to 1907 inclusive. The figures are compiled from the Railway Returns of the Board of Trade.

Railway.		1903.	1904.	1905.	1906.	1907.
Great Eastern	Passengers ...	116,711,082	115,664,034	111,876,048	109,764,176	103,374,928
	Receipts ...	£2,390,135	£2,385,808	£2,352,084	£2,354,681	£2,286,842
Great Northern ...	Passengers ...	38,594,989	40,020,750	39,997,805	40,673,032	39,212,596
	Receipts ...	£1,611,407	£1,587,889	£1,580,992	£1,605,695	£1,611,133
London and South Western.	Passengers ...	62,715,874	62,927,971	63,321,810	65,952,349	63,399,547
	Receipts ...	£2,461,638	£2,460,725	£2,490,988	£2,514,763	£2,514,757
South Eastern and Chatham.	Passengers ...	75,914,566	73,620,584	71,210,581	68,420,275	63,348,718
	Receipts ...	£2,531,033	£2,497,855	£2,508,330	£2,521,246	£2,491,608
London, Brighton and South Coast.	Passengers ...	57,894,947	55,805,114	53,282,203	51,780,929	48,393,297
	Receipts ...	£1,852,104	£1,856,596	£1,834,009	£1,828,512	£1,764,145
Totals	Passengers ...	351,831,458	348,038,453	339,588,447	336,590,761	317,729,086
	Receipts ...	£10,846,317	£10,788,873	£10,766,333	£10,824,897	£10,668,485

APPENDIX A—V.

Mileage of Tramways in Greater London.

Worked by—	Mileage of Tramways in Greater London on 31st December, 1907.											Estimated amount of Completed Track by 31st December, 1908.					
	Electric.						Horse.		Total.			Electric.		Horse.		Total.	
	Open for Traffic.		Under Construction.		Authorised, but not Constructed.		Open for Traffic.		Open for Traffic.		Junction lines to Car Sheds.						
	Single track miles.	Route miles.	Single track miles.	Route miles.	Single track miles.	Route miles.	Single track miles.	Route miles.	Single track miles.	Route miles.		Single track miles.	Route miles.	Single track miles.	Route miles.	Single track miles.	Route miles.
London County Council	133·40	66·90	21·95	11·48	25·24	14·10	80·72	48·90	214·12	(a) 115·8	10·10	177·00	90·5	78·00	43·00	255·00	133·5
Metropolitan Electric Tramway Company.	82·00	41·00	8·00	4·00	34·25	17·12	—	—	82·00	41·00	3·62	102·00	51·00	—	—	102·00	51·00
North Metropolitan Electric Tramway Company.	—	—	—	—	—	—	·75	·75	·75	·75	·30	—	—	75	·75	·75	·75
South Metropolitan Electric Tramway Company.	26·06	13·09	—	—	(b) 11·30	5·65	—	—	26·06	13·09	1·14	26·06	13·09	—	—	26·06	13·09
London United Electric Tramway Company.	100·75	53·75	—	—	32·72	18·77	1·97	1·57	102·72	55·32	4·84	100·75	53·75	1·97	1·57	102·72	55·32
Ilford Urban District Council.	11·16	6·61	—	—	—	—	—	—	11·16	6·61	·20	11·16	6·61	—	—	11·16	6·61
Leyton Urban District Council.	17·69	8·95	—	—	—	—	·55	·40	18·24	9·35	·55	17·69	8·95	·55	·40	18·24	9·35
Walthamstow Urban District Council.	12·53	9·14	—	—	—	—	—	—	12·53	9·14	·60	12·53	9·14	—	—	12·53	9·14
West Ham Urban District Council.	26·44	14·90	—	—	2·66	1·40	—	—	26·44	14·90	2·06	26·90	15·14	—	—	26·90	15·14
Barking Urban District Council.	3·70	2·80	—	—	...	—	—	—	3·70	2·80	·13	3·70	2·80	—	—	3·70	2·80
East Ham Urban District Council.	12·77	6·70	—	—	2·99	2·45	—	—	12·77	6·70	·46	12·77	6·70	—	—	12·77	6·70
Bexley Urban District Council.	6·91	5·27	—	—	—	—	—	—	6·91	5·27	·28	6·91	5·27	—	—	6·91	5·27
Dartford Urban District Council.	8·25	6·50	—	—	—	—	—	—	8·25	6·50	·55	8·25	6·50	—	—	8·25	6·50
Erith Urban District Council.	8·43	4·70	—	—	5·39	3·39	—	—	8·43	4·70	·23	8·43	4·70	—	—	8·43	4·70
Croydon Urban District Council.	19·55	12·00	—	—	3·79	1·98	—	—	19·55	12·00	·60	19·55	12·00	—	—	19·55	12·00
Totals	469·64	252·31	29·95	15·48	118·34	64·86	83·99	51·62	553·63	303·93	25·16	583·70	286·15	81·27	45·72	614·97	331·87

(a) Exclusive of the cable tramway up Highgate Hill. The difference between the total route mileage open for traffic as stated above and the total in the London County Council statement (Appendix C—II (1)) is due to the fact that the latter includes the abandoned Camberwell and Dulwich Tramway, 2·87 route miles, and the approaches to certain car sheds.
(b) It is not proposed to construct these lines.

APPENDIX A—VI.

Table showing density of Population and variations of Rent in different parts of the County of London and certain Outer Districts.

These particulars are compiled from the Board of Trade Report on the Cost of Living of the Working Classes, 1908. The Index Number of Rent is a proportional figure representing variations from the mean of 100.

Metropolitan Boroughs and Outer London Districts.	Area. Acres.	Population in 1901.	Estimated Population in 1906.	Number of Persons per Acre.		Index Number of Rent.
				In 1901.	In 1906 (estimated).	
1. METROPOLITAN BOROUGHS:—						
Battersea	2,160	168,907	179,622	78·2	83·1	96
Bermondsey	1,500	130,760	128,629	87·0	85·7	101
Bethnal Green	759	129,680	130,609	170·8	172·0	107
Camberwell	4,480	259,389	274,132	57·9	61·2	88
Chelsea	660	73,842	74,672	111·9	113·1	102
Deptford	1,563	110,398	115,495	70·0	73·9	88
Finsbury	589	101,463	97,466	172·2	165·4	125
Fulham	1,704	137,289	161,965	80·5	95·0	102
Greenwich	3,852	95,770	105,350	24·9	27·3	88
Hackney	3,289	219,272	230,721	66·7	70·1	96
Hammersmith	2,286	112,239	120,679	49·1	52·8	102
Hampstead	2,265	81,942	89,633	36·2	39·5	104
Holborn	405	59,405	55,805	146·6	137·8	125
Islington	3,092	334,991	344,987	108·4	111·5	104 } * 125 }
Kensington	2,291	176,628	180,952	77·1	78·9	102
Lambeth	4,080	301,895	315,774	74·0	77·4	101 } 96 } * 88 }
Lewisham	7,014	127,495	148,463	18·2	21·1	88
Paddington	1,356	143,976	148,913	106·2	109·8	102
Poplar	2,328	168,822	170,673	72·5	73·3	96
St. Marylebone	1,473	133,301	128,580	90·5	87·3	125
St. Pancras	2,694	235,317	236,455	87·3	87·7	125
Shoreditch	658	118,637	116,108	180·4	176·4	107
Southwark	1,132	206,180	209,143	182·2	184·7	101
Stepney	1,766	298,600	307,176	169·1	173·9	107
Stoke Newington	864	51,247	53,217	59·3	61·5	104
Wandsworth	9,129	232,034	273,381	25·4	29·9	96 } * 88 }
Westminster	2,503	183,011	173,905	73·1	69·5	125
Woolwich	8,277	117,178	127,345	14·2	15·3	88
Total County of London	74,169	4,536,541	4,699,850	61·1	63·2	102·9
2. OUTER LONDON:—						
Acton	2,305	37,744	45,071	16·4	19·5	95
Barnes and Mortlake	2,518	17,821	24,500	7·1	9·7	88
Chiswick	1,249	29,809	34,095	23·9	27·3	95
Ealing	2,947	33,031	37,969	11·2	12·9	95
East Ham	3,326	96,018	129,886	28·9	39 0	79
Edmonton	3,894	46,899	58,481	12·0	15·0	80
Enfield	12,601	42,738	48,857	3·4	3·8	80
Leyton	2,594	98,912	118,287	38·1	45·6	80
Tottenham	3,013	102,541	119,503	34·0	39·6	80
Walthamstow	4,343	95,131	121,334	21·9	27·9	80
West Ham	4,683	267,358	301,617	57·1	64·4	79
Willesden	4,384	114,811	143,622	26·2	32·7	95
Wimbledon	3,221	41,652	50,231	12·9	15·5	88
Wood Green	1,625	34,233	38,833	21·1	23·9	80
Total Outer London	52,703	1,058,698	1,272,336	20·0	24·2	85·3

* Those portions of Islington, Lambeth and Wandsworth having higher Index Numbers are nearer the centre of London.

APPENDIX B.

I. New Railways—including extensions and important widenings—authorised during the years 1903–1907, within a radius of 15 miles of London.

II. Ditto—inspected by Board of Trade during the same period, within the same radius.

III. Statement showing the length of new and existing railways in the London District opened for electric traction, 1890–1907.

IV. Total mileage of London electrical railways open on December 31st, 1907.

APPENDIX B—I.

New Railways—including Extensions and important Widenings of Existing Lines—authorised by Act of Parliament during the years 1903 to 1907 in and within a radius of 15 miles of London.

Title of Act.	Railways authorised.	Length.	Remarks.
		m. chs.	
1903.			
City and South London Railway.	Euston Extension (Angel to Euston Station).	1 28	Opening sanctioned May, 1907.
London, Brighton and South Coast Railway.	Short lines at Deptford	0 43	
Metropolitan District Railway.	Deviation of authorised Deep Level Line from near Gloucester Road to Earl's Court.	0 44	Constructed as part of Great Northern, Piccadilly and BromptonRailway—opened December, 1906.
	Short railways at Mark Lane ...	0 32	Proposed to be abandoned by Bill of Session 1908.
Watford and Edgware Railway.	Electric line from Watford to junction with authorised Edgware and Hampstead Railway at Edgware.	6 17	Time for acquisition of lands will expire in August, 1909, and for construction in August 1911. (Edgware and Hampstead time runs till November, 1908, for acquisition of lands and until November, 1910, for construction.)
1904.			
Great Northern Railway	Widening between Finsbury Park and Finchley (High Barnet Branch).	4 64	
London and North Western Railway.	Royal Show Ground Branch at Willesden (to Royal Agricultural Society's Show Ground).	0 75	
London, Tilbury and Southend Railway.	Widening of Forest Gate Branch between Little Ilford and Barking and of main line at Barking.	0 71	
1905.			
Great Northern, Piccadilly and Brompton Railway.	Short lines in the Holborn and Strand districts.	0 71	In substitution for lines previously authorised—opened December, 1906, and December, 1907.
Great Western Railway (New Railways).	Ealing and Shepherd's Bush Railway.	4 38	
North East London Railway.	City of London to Waltham Abbey —electric line (about 4 miles in tunnel).	14 60	
1906.			
Baker Street and Waterloo Railway.	Deviation line at Paddington ...	0 43	
London, Brighton and South Coast Railway.	Widenings at Sutton...	1 16	
Metropolitan District Railway.	Short lines at Whitechapel, Brentford and Ealing.	0 26	
North West London Railway.	Marble Arch to Victoria (Extension of authorised electric underground line).	1 51	
South Western Railway	Hampton Court Junction Railway (Thames Ditton to Surbiton).	2 9	
1907.			
Central London Railway	Extension (partly in tunnel) to Franco-British Exhibition (Uxbridge Road to Wood Lane).	0 45	Opening sanctioned May, 1908.
London and North Western Railway.	Electric line from Euston (new underground station) to Watford, partly in tunnel (3 miles) and partly (16 miles) alongside existing line.	19 0	Construction understood to be postponed for the present

APPENDIX B—II.

New Railways—including Extensions and important Widenings of Existing Lines—inspected by the Board of Trade during the years 1903 to 1907 in and within a radius of 15 miles of London.

Name of Railway.	Section or Widening Inspected.	Length.	Month.	Remarks.
		m. chs.		
1903.				
GREAT EASTERN	Woodford to Ilford	5 77	April	
	Ilford to Seven Kings Station ...	0 19	Do.	
GREAT WESTERN	West London Junction and Greenford East Junction.	3 68	August	
	Greenford East Junction and Greenford South Junction.	0 26	Do.	
	Greenford South Junction and West Ealing Junction.	1 71	Do.	
	West Ealing North Junction and Hanwell Junction.	0 36	Do.	
LONDON, BRIGHTON AND SOUTH COAST.	*Widening between:* Balham and Croydon.	4 23	July	
	Widening between: Victoria and Pouparts Junction.	0 72	December	
METROPOLITAN DISTRICT ...	Ealing and South Harrow Branch	5 3	June	
MIDLAND	*Widening:* Welsh Harp to Cricklewood.	1 25	December	
SOUTH EASTERN AND CHATHAM.	*Widening:* Orpington to Chislehurst.	1 14	January	
	Part of widening: St. John's and Orpington.	0 55	June	
	Widening: Near Grove Park ...	1 21	November	
	Widening: New Cross to Southwark Park.	1 5	December	
1904.				
GREAT NORTHERN AND CITY	Moorgate Street to Finsbury Park	3 42	February	
GREAT WESTERN	Greenford East and South Junctions to Greenford Station.	1 1	August	
LONDON, TILBURY AND SOUTHEND.	*Widening:* Plaistow to East Ham	2 22	October	
METROPOLITAN	Harrow and Uxbridge Line ...	7 41	June	
SOUTH EASTERN AND CHATHAM.	Chislehurst Loops	1 56	June	
	Widening: St. John's to Parks Bridge Junction.	0 51	January	
	Part of widening: St. John's and Orpington.	0 48	June	
	Widening: Bermondsey to Rotherhithe.	0 55	July	
1905.				
LONDON, TILBURY AND SOUTHEND.	*Widening:* Campbell Road Junction to Bromley.	0 40	February	
	Widening: Bromley to Plaistow ...	0 74	August	
	Widening: Plaistow to West Ham	0 25	November	
METROPOLITAN DISTRICT ...	South Acton Junction Line, connecting the North and South Western Junction Railway with the District Railway at Mill Hill Park Station.	0 37	June	
	Hounslow Curve from the Hounslow Town Branch to Hounslow Barracks Branch.	0 7	June	
SOUTH EASTERN AND CHATHAM.	*Part of widening:* St. John's and Orpington.	0 47	October	
1906.				
BAKER STREET AND WATERLOO.	Baker Street to Kennington Road Station.	3 37	March	
	Extension: Kennington Road to Elephant and Castle Station.	0 43	August	
GREAT CENTRAL	Neasden to Northolt Junction ...	6 29	February	
GREAT NORTHERN, PICCADILLY AND BROMPTON.	Finsbury Park to Hammersmith...	9 0	December	
GREAT WESTERN	Greenford Station to Northolt Junction.	1 57	April	
GREAT WESTERN AND GREAT CENTRAL JOINT.	Northolt Junction to High Wycombe.	16 9	April	This is included because Northolt is within the 15 mile radius.
LONDON AND SOUTH WESTERN	*Widening:* At Lambeth	0 75	February	
MIDLAND	*Widening:* Cricklewood to Finchley Road.	1 60	January	
1907.				
BAKER STREET AND WATERLOO.	*Extensions:* Baker Street to Edgware Road.	0 27	March	
CHARING CROSS, EUSTON AND HAMPSTEAD.	Charing Cross to Golders Green, and the branch from Camden Town to Highgate.	8 8	June	
CITY AND SOUTH LONDON ...	*Extensions:* Angel Station to Euston	1 19	May	
GREAT NORTHERN, PICCADILLY AND BROMPTON.	*Extension:* Holborn to Strand ...	0 40	December	
LONDON AND SOUTH WESTERN	*Widening:* Wandsworth Road to Locomotive Junction(Nine Elms)	0 32	October	

APPENDIX B—III.

Statement showing the Length of New and Existing Railways in the London District opened for Electric Traction, 1890 to 1907.

Year.	Name of Railway.	Route of each Line.	Length of each Line.	Total length of Line opened each year.	Total length of Line open for Electric Traction in the London District at the end of each year.	Year.
			m. chs.	m. chs.	m. chs.	
1890	CITY AND SOUTH LONDON	King William Street (City) to Stockwell.	3 12	3 12	3 12	1890
1891–7	(No Lines were opened for electric traction during these years.)					1891–7
1898	WATERLOO AND CITY (now part of L. & S.W.R.).	Bank to Waterloo	1 42	1 42	4 54	1898
1899		(No openings.)				1899
1900	CENTRAL LONDON	Bank to Shepherd's Bush ...	5 66			
	CITY AND SOUTH LONDON	Borough Junction to Moorgate Street.	1 27 *less* 59* 48	7 32	12 6	1900
	Do. do.	Stockwell to Clapham ...	0 78			
1901	Do. do.	Moorgate Street to Angel, Islington.	1 28	1 28	13 34	1901
1902		(No openings.)				1902
1903	METROPOLITAN DISTRICT...	Mill Hill Park to Harrow ...	6 1	6 1	19 35	1903
1904	GREAT NORTHERN AND CITY.	Moorgate Street to Finsbury Park.	3 42	3 42	22 77	1904
1905	METROPOLITAN	Baker Street to Harrow and Uxbridge.	16 22			
	METROPOLITAN DISTRICT and Lines worked in connection therewith, other than the Inner Circle Railway mentioned below.	Hounslow Line and to South Acton.	6 63			
		Ealing to South Kensington	4 70			
		High Street Kensington to Putney Bridge.	2 63			
	LONDON AND SOUTH WESTERN.	Richmond to Turnham Green.	3 38			
	Do. do.	Wimbledon to Putney Bridge	3 38			
	WHITECHAPEL AND BOW AND LONDON, TILBURY AND SOUTHEND.	Whitechapel to East Ham ...	5 20	55 69	78 66	1905
	Inner Circle. METROPOLITAN ...	Aldgate to South Kensington	7 69			
	Inner Circle. METROPOLITAN DISTRICT.	South Kensington to Mansion House.	4 4			
	Inner Circle. METROPOLITAN AND DISTRICT JOINT.	Mansion House to Aldgate...	1 7			
1906	BAKER STREET AND WATERLOO.	Baker Street to Elephant and Castle.	4 0			
	GREAT NORTHERN, PICCADILLY AND BROMPTON.	Finsbury Park to Hammersmith.	9 0			
	METROPOLITAN and Lines worked in connection therewith.	Praed Street Junction to Bishops Road.	0 29			
	GREAT WESTERN ...	Bishops Road to Green Lanes Junction (near Westbourne Park Station).	0 79			
	GREAT WESTERN AND METROPOLITAN JOINT (Hammersmith and City).	Green Lanes Junction to Hammersmith.	2 38			
		Latimer Road Junction to Uxbridge Road Junction.	0 39			
	WEST LONDON... ...	Uxbridge Road Junction to Addison Road Station.	0 52	18 64	97 50	1906
	METROPOLITAN ...	North Curve Junction near Aldgate to Junction with Metropolitan and District Joint Lines at Aldgate East.	0 11			
	METROPOLITAN AND DISTRICT JOINT.	Aldgate East Junction to a point 5 chains beyond St. Mary's (Whitechapel) Junction.	0 44			
	METROPOLITAN DISTRICT.	From a point 5 chains beyond St. Mary's (Whitechapel) Junction to Whitechapel Station.	0 12			

* Length of previously existing line (Borough Junction to King William Street) thrown out of use for passenger traffic.

APPENDIX B—III.—*continued.*

Year.	Name of Railway.	Route of each Line.	Length of each Line.	Total length of Line opened each year.	Total length of Line open for Electric Traction in the London District at the end of each year.	Year.
			m. chs.	m. chs.	m. chs.	
1907	BAKER STREET AND WATERLOO.	Baker Street to Edgware Road.	0 27	10 14	107 64	1907
	CHARING CROSS, EUSTON AND HAMPSTEAD.	Charing Cross to Golder's Green and Highgate.	8 8			
	CITY AND SOUTH LONDON...	Angel Islington to Euston...	1 19			
	GREAT NORTHERN, PICCADILLY AND BROMPTON.	Holborn to Strand	0 40			

NOTE.—During the present year (1908) there has been opened for electric traction a short extension of the Central London Railway (43 chains) into the Franco-British Exhibition, and electric working has been extended on the District and London, Tilbury and Southend system from East Ham to Barking (1 mile 28 chains).

APPENDIX B—IV.

Total Mileage of London Electrical Railways open on December 31st, 1907.

Name of Railway.	Length of Line.	
	Miles.	Chains.
BAKER STREET AND WATERLOO	4	27
CENTRAL LONDON	5	66
CHARING CROSS, EUSTON AND HAMPSTEAD	8	8
CITY AND SOUTH LONDON	7	25
GREAT NORTHERN AND CITY	3	42
GREAT NORTHERN, PICCADILLY AND BROMPTON	9	40
METROPOLITAN and Lines worked in connection therewith (other than the Inner Circle Railway shown below) :—	22	6
METROPOLITAN	16	62
GREAT WESTERN	—	79
GREAT WESTERN AND METROPOLITAN JOINT (Hammersmith and City).	2	77
WEST LONDON	—	52
METROPOLITAN AND DISTRICT JOINT	—	44
METROPOLITAN DISTRICT	—	12
	22	6
METROPOLITAN DISTRICT and Lines worked in connection therewith (other than the Inner Circle Railway shown below) :—	32	48
METROPOLITAN DISTRICT	20	37
LONDON AND SOUTH WESTERN	6	71
WHITECHAPEL AND BOW, and LONDON, TILBURY AND SOUTHEND.	5	20
	32	48
METROPOLITAN ... ... (Inner Circle Railway.)	7	69
METROPOLITAN DISTRICT ... ... (Inner Circle Railway.)	4	4
METROPOLITAN AND DISTRICT JOINT ... ... (Inner Circle Railway.)	1	7
	13	0
WATERLOO AND CITY (London and South Western)	1	42
Total	107	64

APPENDIX C.

Continuation of Evidence given on behalf of the London County Council before the Royal Commission on London Traffic.

I. Financial information relating to the undertakings of the underground electric railway companies, and the tramway undertakings of the London County Council.

II. The tramways of London. Statement of particulars relating to the various tramways belonging either to the London County Council or to other authorities and companies.

III. Statement of particulars submitted by the Chief Officer of Tramways, London County Council.

IV. Continuation of certain statistics submitted to the Royal Commission on London Traffic by the Statistical Officer of the London County Council.

V. Statement of county and local improvements.

VI. Statement of improvements carried out by Borough and City Councils from 1903 to 1907 inclusive.

VII. Statement by Superintending Architect of the London County Council.

VIII. Statement by the Valuer of the London County Council.

IX. Statement by the Clerk of the London County Council on By-Laws for the Good Rule and Government of the Administrative County of London.

APPENDIX C.—I.

Financial information relating to the undertakings of the electric railway companies in London, and the tramway undertaking of the London County Council, in continuation of similar financial information submitted to the Royal Commission on London Traffic by the Comptroller to the London County Council.

Royal Commission on London Traffic Vol. III., Appendix 10, *pp.* 283–308.

MEMORANDUM.

In the accompanying tables the information given by me in 1903 before the Royal Commission on London Traffic has been revised to the end of the year 1907.

I.—*Electric Railways.*

Tables I. to VI. relate to the electric railways now in operation, viz. :—

Baker street and Waterloo.
Central London.
Charing Cross, Euston and Hampstead.
City and South London.
Great Northern and City.
Great Northern, Piccadilly and Brompton.
Metropolitan.
Metropolitan District.
Waterloo and City.

The tables show the capital of the companies, cost per mile, traffic receipts, working expenses, dividends paid, for the period from 1903 to 1907. No information is available as to the amount of urban traffic carried on trunk railways having termini in London.

Table I. gives the mileage and capital of electric railways in operation also the authorised capital of electric railways authorised, but not yet commenced.

Table II. gives for the five years 1903 to 1907 particulars of receipts, working expenses, profits, number of passengers, etc., etc., of electric railways now in operation.

MR. H. E. HAWARD.

Table III. gives the mileage and capital of the undertakings which are or may ultimately be controlled by the Underground Electric Railways Company of London, Limited.

Memorandum.

Table IV. shows the mileage and capital of authorised electric railway undertakings, other than those shown in Table III.

Table V. gives the number of passengers carried on the tube railways in the year to 31st December, 1907, and the additional number of passengers at average fare required to enable a dividend of 4 per cent. to be paid on the ordinary stock, assuming that working expenses are 50 per cent. of the receipts.

Table VI. shows the results of working for the year 1907, and the financial position at 31st December, 1907.

II.—*L.C.C. Tramways.*

Tables VII. and VIII. deal with the Council's tramways. Table VII. shows the capital expenditure on tramways to the 31st March, 1908, together with the further expenditure to which the Council is committed.

Table VIII. gives a summary of the results of the working of the tramways for the six years 1902-3 to 1907-8. The figures for the years up to and including 1904-5 relate to the southern system only; the year 1905-6 includes the working of the Aldwych to Islington line from 24th February to 31st March, 1906, and the years 1906-7 and 1907-8 include the working of the whole system, both north and south of the Thames. The table of results is self-explanatory and shows the charges made out of the net revenue of the undertaking to meet interest on and repayment of capital, and the provision made for renewals, etc.

Up to the present time all expenditure on renewals has been defrayed directly out of revenue, as part of the cost of repairs. The Renewals Reserve Fund at 31st March, 1907, amounted to £141,855 and no charges thereto have been made for renewals. The whole question of the provision for renewals is under the consideration of the Finance and Highways Committees of the Council.

The capital expenditure on tramways is made repayable partly in 60 years and partly in 25 years. To the 60 years' term are charged—Purchase of the larger undertakings, except horses, rolling stock and other short-lived items; cost of land, new buildings and street improvements. To the 25 years' term are charged—Purchase of the smaller undertakings; horses and rolling stock for horse tramways; construction of tramway tracks for electric traction, including ducts, cables and other electrical equipment; cars for electric traction and machinery for the generating station and sub-stations.

Repayment of debt is provided for upon the system of equal instalments of principal, *i.e.*, one-sixtieth or one-twenty-fifth part of the debt is paid off each year, and the interest charge consequently decreases year by year.

H. E. HAWARD,
Comptroller.

LONDON LOCOMOTION.

TABLE I.—Showing mileage and capital authorised at 31st December, 1907, of electric railways (1) in operation; (2) authorised but not commenced.

COMPANY.	Length of line authorised after allowing for alterations and deviations.			Capital authorised.			REMARKS.
				Share.	Loan.	Total.	
1. *Railways now in operation.*	m.	f.	c.	£	£	£	
Baker-street and Waterloo	5	2	0	2,673,000	890,000	3,563,000	
Central London	6	7	2·7	3,150,000	976,000*a*	4,126,000*a*	(*a*) After deducting £74,000 in respect of interest paid out of capital during construction.
Charing Cross, Euston and Hampstead.	8	2	0·8	4,326,000	1,442,000	5,768,000	
City and South London ...	12	2	1·5	3,480,000	1,111,859*b*	4,591,859*b*	(*b*) After deducting £6,141 interest paid out of capital during construction.
Great Northern and City ...	2	7	7·9	2,010,000	634,416*c*	2,644,416*c*	(*c*) After deducting £35,584 in respect of interest paid out of capital during construction.
Great Northern (*d*) ...		6	4·2	325,000	108,000	433,000	(*d*) Leased to Great Northern and City Company.
Great Northern, Piccadilly and Brompton.	8	5	1·3	5,405,000	1,801,000	7,206,000	
Metropolitan	77	5	5	12,504,103*e*	5,166,939	17,671,042*e*	(*e*) Excluding £2,640,915 Surplus Land Stock.
Metropolitan District ...	32	2	7	11,601,666	3,436,374	15,038,040*f*	(*f*) Including £636,508 nominal addition to capital.
Waterloo and City (*g*) ...	1	4	6·8	540,000	180,000	720,000	(*g*) Acquired by London and South Western Railway Company, 1906.
	156	5	7·2	46,014,769	15,746,588	61,761,357	
2. *Railways authorised but not commenced.*							
Edgware and Hampstead...	4	5	2	360,000	120,000	480,000	Powers transferred to the Watford and Edgware Company by Act of 1906.
London and North-Western (Watford to Euston).	17	4	0	2,700,000	900,000	3,600,000	
North-East London ...	14	6	0	3,250,000	1,083,333	4,333,333	
North-West London ..	5	6	6·6	2,550,000	850,000	3,400,000	
Watford and Edgware ...	6	1	7·1	300,000	100,000	400,000	
	48	7	5·7	9,160,000	3,053,333	12,213,333	
Total	205	5	2·9	55,174,769	18,799,921	73,974,690	

LONDON LOCOMOTION.

TABLE II.—Giving particulars of receipts, working expenses, profits, number of passengers, &c., &c., of electric railways now in operation.

COMPANY.	1903.	1904.	1905.	1906.	1907.
BAKER-STREET AND WATERLOO.				(42 weeks' working)	
Route mileage open for traffic	—	—	—	3m. 5f. 3c.	4m. 5f. 5·2c.
Number of passengers carried	—	—	—	9,806,171	20,599,871
Receipts from passenger traffic	—	—	—	£67,510	£128,037
Receipts from other sources	—	—	—	£4,844	£7,395
Working expenses...	—	—	—	(*a*) £50,009	£86,053
Percentage of working expenses to receipts from passenger traffic.	—	—	—	74·1	65·6
Total amount paid in dividends and interest.	—	—	—	£21,400	£44,110
Rate of dividend paid on ordinary shares (other than those held by the Underground Company or their nominees).	—	—	—	3 per cent. (Payable by Underground Co.)	3 per cent. (Deficiency payable by Underground Co.)
CENTRAL LONDON.					
Route mileage open for traffic	6m. 3f. 4·7c.	6m. 3f. 4·7c.	6m. 3f. 4·7c.	6m. 3f. 4·7c.	6m. 3f. 4·7c.
Number of passengers carried	44,953,988	44,875,547	44,731,501	43,057,997	36,907,491
Receipts from passenger traffic	£349,376	£347,588	£346,405	£332,143	£295,932
Receipts from other sources	£14,140	£15,792	£15,837	£17,155	£18,973
Working expenses...	£193,661	£191,555	£190,342	£187,815	£178,290
Percentage of working expenses to receipts from passenger traffic.	54·9	54·9	54·9	56·5	60·2
Total amount paid in dividends and interest.	£150,695	£154,861	£154,861	£154,861	£124,861
Rate of dividend paid on deferred stock	4 per cent.	4 per cent.	4 per cent.	4 per cent.	2 per cent

(*a*) Maintenance and repairs payable by Underground Company.

MR. H. E. HAWARD.

Table II.—*continued.*

COMPANY.	1903.	1904.	1905.	1906.	1907.
CHARING CROSS, EUSTON AND HAMPSTEAD.					(6 months only)
Route mileage open for traffic	—	—	—	—	8m. 0f. 4·61c.
Number of passengers carried	—	—	—	—	9,881,357
Receipts from passenger traffic	—	—	—	—	£70,272
Receipts from other sources	—	—	—	—	£4,183
Working expenses...	—	—	—	—	£61,354
Percentage of working expenses to receipts from passenger traffic.	—	—	—	—	87·3
Total amount paid in dividends and interest.	—	—	—	—	£15,910 (Deficiency paid by the Underground Electric Railways Co.)
Rate of dividend paid on ordinary shares	—	—	—	—	Nil.
CITY AND SOUTH LONDON.					
Route mileage open for traffic	6m. 7f. 1c.	6m. 7f. 1c.	6m. 7f. 1c.	6m. 7f. 1c.	7m. 2f. 6·1c.
Number of passenger carried (excluding season-ticket holders).	18,222,512	17,628,833	17,270,074	18,149,413	20,780,925
Receipts from passenger traffic	£150,671	£147,093	£141,906	£144,682	£160,979
Receipts from other sources	£7,169	£8,025	£9,909	£14,640	£14,765
Working expenses...	£74,203	£71,938	£69,982	£70,517	£77,971
Percentage of working expenses to receipts from passenger traffic.	49·2	48·9	49·3	48·7	48·4
Total amount paid in dividends and interest.	£80,954	£79,423	£78,916	£84,651	£94,437
Rate of dividend paid on ordinary stock	2¾ per cent.	1 11/16 per cent.	1 11/16 per cent.	2¼ per cent.	2¼ per cent.
GREAT NORTHTRN AND CITY.					
Route mileage open for traffic—					
Owned	—	—	2m. 5f. 7c.	2m. 5f. 7c.	2m. 5f. 7c.
Leased	—	—	6f. 4c.	6f. 4c.	6f. 4c.
Number of passengers carried	—	—	14,911,017	15,989,663	15,812,609
Receipts from passenger traffic	—	—	Line worked by contractors		£91,548
Receipts from other sources	—	—			£5,873
Working expenses...	—	—			£49,394
Percentage of working expenses to receipts from passenger traffic.	—	—			53·9
Total amount paid in dividends and interest.	—	—	£56,844	£56,844	£20,169
Rate of dividend paid on ordinary stock	—	—	(*b*) 3 per cent.	(*b*) 3 per cent.	Nil
GREAT NORTHERN, PICCADILLY AND BROMPTON.					
Route mileage open for traffic, including lines leased or rented.	—	—	—	—	9m. 3f. 9·62c.
Number of passengers carried	—	—	—	—	25,868,538
Receipts from passenger traffic	—	—	—	—	£217,844
Receipts from other sources	—	—	—	—	£8,647
Working expenses...	—	—	—	—	£146,547
Percentage of working expenses to receipts from passenger traffic.	—	—	—	—	67·3
Total amount paid in dividends and interest.	—	—	—	—	£52,497
Rate of dividend paid on ordinary shares	—	—	—	—	4 per cent. (On shares other than those held by the Underground Electric Railways Co., and partly paid by that Company.)
METROPOLITAN.					
Route mileage open for traffic	77m. 3f. 4c.	77m. 3f. 4c.	77m. 3f 4c.	77m. 3f. 4c.	77m. 5f. 5c.
Number of passengers carried	94,000,150	94,436,498	95,694,616	98,384,766	96,859,108
Receipts from passenger traffic	£638,034	£643,330	£649,879	£578,781	£566,087
Receipts from other sources	£278,562	£308,045	£292,075	£264,459	£263,364
Working expenses...	£424,250	£426,612	£433,964	£435,455	£401,636
Percentage of working expenses to receipts from passenger traffic.	66·5	66·3	66·8	75·2	70·9
Total amount paid in dividends and interest.	£476,689	£511,271	£507,828	£429,136	£412,346
Rate of dividend paid on ordinary stock	2½ per cent.	3 per cent.	2½ per cent.	1 per cent.	½ per cent.
METROPOLITAN DISTRICT.					
Route mileage open for traffic including lines of other companies worked over.	58m. 1f. 9c.	58m. 1f. 9c.	47m. 2f. 0c.	47m. 2f. 0c.	47m. 2f. 0c.
Number of passengers carried	50,039,571	51,167,792	51,548,417	55,062,424	51,235,557
Receipts from passenger traffic... ...	£370,323	£366,392	£373,136	£403,315	£406,982
Receipts from other sources	£69,941	£76,435	£91,334	£85,128	£95,266
Working expenses...	£235,468	£229,368	£258,955	£326,384	£300,006
Percentage of working expenses to receipts from passenger traffic.	63·6	62·6	69·4	80·9	73·7
Total amount paid in dividends and interest (including interest on temporary loans).	£132,960	£142,255	£149,587	£163,254	£199,768
Rate of dividend paid on ordinary stock	Nil	Nil	Nil	Nil	Nil

(*b*) Paid by contractors under agreement.

TABLE III.—Showing mileage and capital at 31st December, 1907, of the undertakings which are, or may ultimately be, controlled by the Underground Electric Railways Company of London, Limited.

(a) *Metropolitan District Railway.* (32 m. 2 f. 7 c.)

Act.	Capital authorised.			Description.	Capital created and issued.			Remarks.
	Share.	Loan.	Total.		Created. Share.	Received. Share (including preference).	Loan.	
	£	£	£		£	£	£	
1864 to 1906.	11,025,158	3,376,374	14,401,532	Ordinary	3,235,000	3,235,000	—	
				5 per cent. Extension Preference Stock (*a*)	1,500,000	1,500,000	—	See (*a*) below.
Nominal addition on conversion of stocks under Act of 1903.	*576,508*	*60,000*	*636,508*	4 per cent. Guaranteed	1,250,000	1,250,000	—	
				3 per cent. Consolidated Rent Charge Stock— Created under Section 73 of the Company's Act of 1903, in exchange for— £				
				Hammersmith rent charge 4½ per cent. ... 244,444				
				Ealing rent charge 4½ per cent. ... 250,000				
				Fulham rent charge 4½ per cent. ... 300,000	2,116,666	2,116,666	—	The company obtained Parliamentary power (Session 1903) to consolidate these stocks, together with the stock then proposed to be created in connection with the acquisition of the Hounslow and Metropolitan Railway undertaking. The figure includes £576,508 added on conversion.
				Bow Extension 4 per cent. ... 330,000				
				Ealing and Harrow 3½ per cent. ... 250,000				
				Hounslow rent charge 3½ per cent. ... 165,714				
				Added on consolidation 576,508				
				5 per cent. Second Preference Stock (*b*)...	1,470,000	1,470,000	—	
				6 per cent. Perpetual Debenture Stock	—	—	1,211,625	
				4 per cent. Perpetual Debenture Stock	—	—	727,200	Including £60,000 nominal addition on conversion of stocks under Act of 1903.
				4 per cent. Perpetual Debenture Stock (1903 issue)	—	—	897,000	
	11,601,666	3,436,374	15,038,040		9,571,666	9,571,666	2,835,825	

(*a*) The Underground Company guarantees to holders accepting their guarantee the following rates of interest, viz.—1 per cent. from 1st January, 1903, to 1st January, 1904; 2 per cent. from 1st January, 1904, to 1st January, 1905; 3 per cent. from 1st January, 1905, to 1st January, 1907; and 3½ per cent. thereafter in perpetuity. The surplus, if any, beyond the above amounts earned in any year up to 5 per cent. will belong to the guaranteeing company, who will, during the continuance of their guarantee, exercise all voting powers in respect of the aforesaid stock, subject to the restriction that the vote shall on no occasion be used for the purpose of reducing the interest payable by the Metropolitan District Company upon their preference stock. The position of stockholders not accepting the guarantee remains undisturbed. At a meeting of the company held on 22nd April, 1903, Mr. Perks stated that holders of preference stock to the extent of £400,000 had accepted the offer.

(*b*) 150,000 issued in 1904, in lieu of the Bow extension second guaranteed stock. The whole of the stock has been taken by the Underground Electric Railways Company.

LONDON LOCOMOTION.

TABLE III. (*continued*).—Showing mileage and capital of the undertakings which are, or may ultimately be, controlled by the Underground Electric Railways Company of London, Limited.

(b) *Tube Railways.*

Company.	Act.	Capital authorised.			Capital created and issued.				Remarks.
		Share.	Loan.	Total.	Description.	Share (including Preference Shares).		Loan.	
						Created.	Received.		
		£	£	£		£	£	£	
Baker Street and Waterloo	1893	1,250,000	416,000	1,666,000	Shares, £10	2,013,000	1,723,520	—	
	1896	75,000	25,000	100,000	Preference, £10, 4 per cent.	660,000	660,000	—	
(5 m. 2 f. 0 c.)	1899	60,000	20,000	80,000					
	1900	1,000,000	333,000	1,333,000					
	1904	288,000	96,000	384,000	4 per cent. Deb. Stock ...	—	—	661,000	
		2,673,000	890,000	3,563,000		2,673,000	2,383,520	661,000	
Charing Cross, Euston and Hampstead ...	1893	1,416,000	472,000	1,888,000	Shares, £10	4,326,000	4,076,000	—	
	1899	360,000	120,000	480,000	4 per cent. Per. Deb. Stock...	—	—	795,500	
(8 m. 2 f. 0·8 c.)	1902	2,550,000	850,000	3,400,000					
		4,326,000	1,442,000	5,768,000		4,326,000	4,076,000	795,500	
Gt. Northern, Piccadilly and Brompton— Brompton and Piccadilly	1897	600,000	200,000	800,000	Shares, £10	3,200,000	5,045,400	—	The holders of 320,000 of the issued shares are entitled to a cumulaiive preferential dlvidend of 4 per cent.
Ditto ditto	1899	400,000	133,000	533,000	Shares, £10	2,205,000			
Ditto ditto	1902	1,425,000	475,000	1,900,000					
Great Northern and Strand	1899	2,400,000	800,000	3,200,000	4 per cent. Per. Deb. Stock...	—	—	1,156,700	
Gt. Northern, Piccadilly and Brompton	1903	250,000	83,000	333,000					
Ditto ditto (8 m. 5 f. 1·3 c.)	1905	330,000	110,000	440,000					
		5,405,000	1,801,000	7,206,000		5,405,000	5,045,400	1,156,700	

Edgware and Hampstead ... ... (4 m. 5 f. 2 c.)	1902	360,000	120,000	480,000	Shares...	360,000	11,334	—	Powers transferred to the Watford and Edgware Company by Watford and Edgware Act of 1906.
Watford and Edgware (6 m. 1 f. 7·1 c.)	1903	300,000	100,000	400,000	—	—	—	—	
Total (33 m. 0 f. 1·2 c.)		13,064,000	4,353,000	17,417,000		12,764,000	11,516,254	2,613,200	

(c) *Tramways.*

London United Tramways Company, Limited—								
Ordinary	—	1,250,000	—	1,250,000	Ordinary, fully paid ... Pref. 5 p.c. cum. fully pd.	1,000,000	1,000,000	—	
Preference (5 per cent. cumulative) ...	—	1,250,000	—	1,250,000	„ £1 paid ...	1,250,000	1,250,000	—	
4 per cent. 1st Mortgage Deb. Stock ...	—	—	1,395,689	1,395,689	Deb. Stock, 4 per cent. ...	—	—	1,395,689	
(55½ *miles open for traffic.*)		2,500,000	1,395,689	3,895,689		2,250,000	2,250,000	1,395,689	

SUMMARY.

	Length.	Capital authorised.
	m. f. c.	£
Metropolitan District Railway ... ... about	32 2 7	15,038,040
Tube Railways	33 0 1·2	17,417,000
Tramways	55 2 0	3,895,689
	120 4 8·2	£36,350,729

LONDON LOCOMOTION.

TABLE IV.—Showing mileage and capital of the electric railways other than those associated with the Underground Electric Railways Company of London, Limited.

Company.	Act.	Capital authorised.			Capital created and issued.				Remarks.
		Share.	Loan.	Total.	Description.	Share (including Preference).		Loan.	
						Created.	Received.		
		£	£	£		£	£	£	
Central London	1891	2,700,000	900,000	3,600,000	Ordinary Stock ...		1,893,610		
(6 m. 7 f. 2·7 c.)	1892	150,000	50,000	200,200	Preferred Stock ...	3,150,000	553,195		
	1894	—	—	—	Deferred Stock ...		553,195		
	1899	—	—	—	4 per cent. Deb. Stock ...	—	—	871,536	
	1900	—	—	—					
	1901	150,000	50,000	200,000					
	1902	150,000	50,000	200,000					(*a*) The amount authorised to be raised by loan was at 31st December, 1907, reduced by £74,000 in respect of interest paid out of capital.
		3,150,000	1,050,000*a*	4,200,000		3,150,000	3,000,000	871,536	
City and South London	1884	300,000	100,000	400,000	Consolidated Ordinary ...	1,680,000	1,480,000		The original powers of this company were obtained under the name of the City of London and Southwark Subway. By the Act of 1890 the name was changed to the City and South London.
(12 m .2 f. 1·5 c.)	1887	300,000	75,000	375,000	5 per cent. Pref., 1891 ...	150,000	150,000		
	1890	200,000	50,000	250,000	5 per cent. Pref., 1896 ...	200,000	200,000		
	1893	750,000	250,000	1,000,000	5 per cent. Pref., 1901 ...	300,000	300,000		The unissued Ordinary Stock may be issued as preference stock at the option of the directors. The City and South London Act of 1903 provides for the transfer of the powers of the City and Brixton Railway Company to the City and South London Company, who may, if they so decide, re-constitute the City and Brixton Railway a separate undertaking.
	1895	30,000	10,000	40,000	5 per cent. Pref., 1903 ...	150,000	150,000		
	1898	100,000	33,000	133,000	4 per cent. Deb. Stock ...	—	—	641,623	
	1901	300,000	100,000	400,000					
	1903	1,500,000	500,000	2,000,000					
		3,480,000	1,118,000*b*	4,598,000		2,480,000	2,280,000	641,623	(*b*) The amount authorised to be r ised by loan was at 31st December, 1907, reduced by £6,141 in respect of interest paid out of capital.

Great Northern and City	1892	1,500,000	500,000	2,000,000	Pref. Ordinary "A" ..	780,000	780,000		
(2 m. 7 f. 7·9 c.)	1895	—	—	—	Deferred Ordinary "B" ...	780,000	780,000		
	1897	60,000	20,000	80,000	4 per cent. Preference ...	450,000	—		
	1903	450,000	150,000	600,000	4 per cent. Deb. Stock ...	—	—	504,216	(c) The amount authorised to be raised by loan was at 31st December, 1907, reduced by £35,584 in respect of interest paid out of capital.
		2,010,000	670,000c	2,680,000		2,010,000	1,560,000	504,216	
Great Northern Railway ... ... (6 f. 1·2 c.)	1902	325,000	108,000	433,000		Information not available.			This line is leased to the Great Northern and City Company. The sum of £325,000 is in addition to any sum which the Great Northern Railway Company may raise and not require under any other Act.
London and North Western (Watford to Euston). (17 m. 4 f. 0 c.)	1907	2,700,000	900,000	3,600,000		Nil	Nil	Nil	
North-East London	1905	3,000,000	1,000,000	4,000,000					
(14 m. 6 f. 0 c.)	1906	250,000	83,333	333,333					
		3,250,000	1,083,333	4,333,333		Nil	Nil	Nil	
North-West London	1899	1,500,000	500,000	2,000,000					
(5 m. 6 f. 6·6 c.)	1906	1,050,000	350,000	1,400,000					
		2,550,000	850,000	3,400,000		Nil	Nil	Nil	
Waterloo and City	1893	540,000	180,000	720,000	Ordinary	540,000	540,000	—	This line has been acquired by the London and South Western Railway Company, under powers granted by a special Act in 1906.
(1 m. 4 f. 6·8c.)					3 per cent. Deb. Stock ...	—	—	66,000	
		540,000	180,000	720,000		540,000	540,000	66,000	
Metropolitan ... ... (77 m. 5 f. 5 c.)	1859 to 1905	11,549,900	4,696,258	16,246,158	Consolidated Ordinary ...	5,732,062	5,732,062	—	These figures do not include Surplus Land Stock, which under Acts of 1885 and 1887 has been issued to the nominal amount of £2,640,915.
					Under Act of 1905	800,000	—	—	
					3½ per cent. Preference ...	3,611,558	3,611,558	—	
Including lines partly owned.					3½ per cent. A Preference...	1,110,715	1,110,715	—	
Add nominal additions on conversion of capital.		*954,203*	*470,681*	*1,424,884*	3½ per cent. Convert. Pref...	1,249,768	1,249,768	—	
					4 per cent. Term. Deb. Stock	—	—	50,000	
					3½ per cent. Deb. Stock ...	—	—	3,601,278	
					3½ per cent. A. Deb. Stock...	—	—	750,414	
		12,504,103	5,166,939	17,671,042		12,504,103	11,704,103	4,401,692	
Total (140 m. 2 f. 4·7 c.)		30,509,103	11,126,272	41,635,375		20,684,103	19,084,103	6,485,067	

MR. H. E. HAWARD.

Table IV.—*continued.*

LONDON LOCOMOTION

TABLE V.—Showing number of passengers carried on tube railways during year to 31st December, 1907, and additional number of passengers required in order to pay interest at 4 per cent. on the capital raised at 31st December, 1907.

Name of Railway.	Number of passengers carried (including season-ticket holders).	Average fare per passenger.	Amount available out of net revenue for distribution in dividends on preference and ordinary stock.	Dividend paid on ordinary stock for year 1907.	Additional revenue and passengers required at average fare in order to pay interest at 4 per cent. on the ordinary capital.	
					Additional revenue required assuming ratio of working expenses to receipts at 50 per cent.	Additional passengers required.
		d.	£		£	
Baker Street and Waterloo	20,599,871	1·49	15,230	3 per cent. [deficiency paid by construction company under agreement].	120,817	19,460,000
Central London	36,907,491	1·92	101,142	4 per cent. on Pref. Ordinary 3 per cent. on Undivided Ordinary 2 per cent. on Deferred Ordinary,	5,059	632,000
Charing Cross, Euston and Hampstead... ...	—	—	(Commenced	working June, 1907)	—	—
City and South London	20,780,925*	1·76	68,799	2½ per cent.	76,450	10,425,000
Great Northern and City	15,812,609	1·39	380	Nil	122,674	21,182,000
Great Northern, Piccadilly and Brompton ...	25,868,538	2·02	1,844	Interest at 4 per cent. paid on shares other than those held by the Underground Railways Company. Deficit paid by construction company under agreement.	332,691	39,527,000

* Excluding season-ticket holders.

ELECTRIC RAILWAYS.

TABLE VI.—Showing the capital of the Companies at 31st December, 1907, and the financial results of working for the year 1907.

Railway.	Capital authorised.	Capital received.	Capital expenditure.	Mileage—(1) Authorised. (2) Open for traffic.	Capital expenditure per mile open for traffic.	Receipts from all sources.	Working expenses.	Surplus.	Debenture interest—(1) Amount, (2) Rate per annum and special charges.	Dividends—(1) Amount. (2) Rate per annum.	Carried to—(1) Reserve fund. (2) Renewal fund.	Balance carried forward, increased or reduced.	Total of reserve funds, including balance carried forward.	Passengers carried, including season-ticket holders.	Average fare per passenger.
	£	£	£	m. f. ch.	£	£	£	£			£	£	£		d.
1 Baker Street and Waterloo.	3,563,000	3,044,520	3,121,986	(1) 5 2 0 (2) 4 5 5·20	665,658	135,433	86,053	49,380	(1) £26,440 (2) 4 per cent. Other interest, rents, &c., £7,710.	(1) £17,670 (2) 4 per cent. on Preference, 3 per cent. on Guaranteed Stock. Deficiency (£2,440) paid by Underground Electric Railways Company under construction contract.	Nil	Nil	Nil	20,599,871	1·49
2 Central London ..	4,126,000 (a)	3,871,536	3,992,180	(1) 6 7 2·7 (2) 6 3 4·7	620,506	314,905	178,290	136,615	(1) £34,861 Debenture (2) 4 per cent. Special charges, £6,143.	(1) £90,000 (2) Preferred Ordinary, 4 per cent. Deferred Ordinary, 2 per cent. Undivided Ordinary, 3 per cent.	(1) 10,000	– 4,389	73,098	36,907,491	1·92
3 Charing Cross, Euston and Hampstead.	5,768,000	4,871,500	5,622,177	(1) 8 2 0·76 (2) 8 0 4·61	697,746	74,455 (b)	61,354 (b)	13,101 (b)	(1) £15,910 (f) (2) 4 per cent. Other interest, rents, &c., £2,726.	Nil Deficiency of Debenture interest paid by Underground Electric Railways Company.	Nil	Nil	Nil	(b) 9,881,357	1·71
4 City and South London.	4,591,859 (c)	3,024,060 including £102,437 premium	3,124,760	(1) 12 2 1·5 (2) 7 2 6·1	426,516	175,737	77,979	97,758	(1) £24,237 (2) 4 per cent. Special charges, £1,722.	(1) £70,200 (2) 2½ per cent. Ord., 5 per cent. Pref.	(2) 3,000	– 1,401	3,976	ex. seasons. 20,780,925	1·76
5 Great Northern and City.	2,644,416 (c)	2,061,216	2,310,762 (d)	(1) 2 7 7·93 (2) 2 5 7·17	851,227	97,420	49,394	48,026	(1) £20,169 (2) 4 per cent. Other interest, £9,539 Rents, £16,006 Special charges, £933.	Nil	(2) 1,000	379	1,379	15,812,609	1·39
6 Great Northern, Piccadilly and Brompton.	7,206,000	6,202,100	6,768,442	(1) 8 5 1·30 (2) 8 5 1·30	786,271	226,492	146,547	79,945	(1) £45,396 (f) (2) 4 per cent. General interest, £7,764 Rents and wayleaves, £24,989.	(1) £7,101 (2) 4 per cent. on shares other than those held by the Underground Electric Railways Company. Deficiency on Debenture interest (£5,270) for half-year to 30th June paid by Underground Electric Railways Company.	Nil	14	14	25,868,538	2·02
7 Metropolitan District.	16,038,040 (h)	12,407,491 (h)	12,085,405	(1) 32 2 7 (owned and partly owned) (2) 28 0 2 (owned and partly owned)	(Say) 470,000	502,248	300,006	202,242	(1) £137,660 (2) 4 per cent. and 6 per cent. Other interest and rent charges, £117,009.	(1) £21,093 (2) 1¼ per cent. on Guar. Stock.	Nil	Deficit 73,520 charged to capital.	Nil	51 235,557	1·91
8 Metropolitan ..	17,671,042 (h) 2,640,915 (g)	16,105,795 (h) 2,640 915 (g)	14,962,595	(1) 77 5 5 (owned and partly owned) (2) 77 5 5 (owned and partly owned)	—	839,451	401,636	427,815	(1) £174,664, including rents and wayleaves. (2) 4 per cent. and 3½ per cent. Special charges, £8,688	(1) £237,682 (2) 3¼ per cent. Pref., ½ per cent. Ord.	(1) 1,068 (2) 6,000	– 307	136,993	96,859,108	1·40

(a) After deducting £74,000 in respect of interest paid out of capital during construction.
(b) Half-year's working only.
(c) After deducting £6 141 in respect of interest paid out of capital during construction.
(d) Excluding £60 000 for interest and £35,000 for claims, payable to contractors in shares and not bearing interest.
(e) After deducting £35,584 in respect of interest paid out of capital during construction.
(f) Deficiency of £5 270 paid by Underground Electric Railways Company.
(g) Surplus land stock.
(h) Including nominal additions.
(i) Deficiency payable by Underground Electric Railways Company.

MR. H. E. HAWARD.

Tables VII. & VIII.

LONDON LOCOMOTION.

LONDON COUNTY COUNCIL TRAMWAYS.

TABLE VII.—Showing the expenditure of the Council to the 31st March, 1908, and further expenditure to which the Council stands committed.

		£
(1) Total expenditure to 31st March, 1908		8,415,000
(2) Further expenditure after 31st March, 1908, in respect of estimates passed up to that date (including £157,000 in respect of street improvements).		1,484,000
(3) Estimated further expenditure after 31st March, 1908—	£	
Reconstruction of existing lines (including carsheds, sub-stations, machinery, high tension cables, &c.).	1,675,000	
Construction of authorised lines	426,000	
Further street improvements—provision for sums chargeable to tramways.	250,000	
Provision for extra cars when services are developed	100,000	
		2,451,000
		£12,350,000

NOTE.—The figure of £11,422,000 was given before the Royal Commission in 1903 as the amount which the Council had expended or had pledged itself to expend on tramways. The amount to which the Council at present stands committed has increased, chiefly by reason of additional tramways having been authorised by Parliament.

If the Council is successful in obtaining powers in the present session for further lines, the commitments will be increased by about £120,000, but, on the other hand, there will probably be a considerable set-off against the total expenditure in respect of the sale of existing horse depôts, which will not be required when electrification is complete.

LONDON COUNTY COUNCIL TRAMWAYS.

TABLE VIII.—Showing the financial results of the tramways worked by the Council for the years 1902-3 to 1907-8.

—	1902-3.	1903-4.	1904-5.	1905-6.	1906-7. (e)	1907-8 (partly estimated) (e)
Receipts.	£	£	£	£	£	£
Electric	—	226,536	548,296	629,254	829,259	1,277,310
Horse	444,699	309,704	133,799	155,350	585,345	386,250
Total	444,699	536,240	682,095	784,604	1,414,604	1,663,560
Working expenses.						
Electric	—	143,429	340,987	407,758	478,419	699,750
Horse	382,244	293,211	134,328	154,198	596,697	445,730
Total	382,244	436,640	475,315	561,956	1,075,116	1,145,480
Surplus on working.						
Electric	—	83,107	207,309	221,496	350,840	577,560
Horse	62,455	16,493	—529	1,152	—11,352	—59,480
Total	62,455	99,600	206,780	222,648	339,488	518,080
Charges against surplus.						
Interest on capital (less income tax)	25,628	57,012	67,546	84,057	(a)162,927	222,130
Repayment of capital	24,242	43,525	69,408	91,867	153,155	216,203
Income tax	3,836	2,200	3,261	8,000	(b)10,000	15,000
Special charges and sundries	—	5,146	24,510	2,146	3,732	—1,800
Total	53,706	107,883	164,725	186,070	329,814	451,533
Net surplus	8,749	—8,283	42,055	36,578	9,674	66,547
Renewals—Amount transferred to Reserve Fund.	11,000	—	35,000	35,000	35,000	72,470
Balance (d)	—2,251	—8,283	+7,055	+1,578	—25,326	—5,923

(a) Gross interest (£171,502) shown in accounts.
(b) Net tax, after allowing for amount retained from interest on debt, shown in accounts (£1,425).
(c) Total charges against surplus as accounts, £334,212; less interest on cash balances, £4,398=£329,814.
(d) Deficiencies have been met out of surpluses from lines not worked by the Council or out of balances brought forward.
(e) Including figures relating to a short length of line worked by a company under licence (Archway Road).

APPENDIX C—II.

THE TRAMWAYS OF LONDON.

Details of the various Tramways in London, belonging either to the Council or to other authorities and companies; and of the steps taken by the Council for the purchase of Tramways, the reconstruction of existing lines for electric traction, the obtaining of Parliamentary powers for new lines, and the construction of such lines. [Revised to 14th February, 1908.]

I.—TOTAL LENGTH OF TRAMWAYS IN LONDON.

The total length of tramways in London at the present time is about 131⅜ route or street miles. Out of this length, about 120⅜ miles belong to the Council, and the remainder of about 11 miles to other authorities and companies.

(a) *The Council's Tramways.*

The Council's tramways consist of lines purchased from various companies, and new lines constructed by the Council itself, from time to time, as follows :—

Name of undertaking.	Date of transfer to Council.	Approximate length (street miles).	Remarks.
A.—Purchased lines :—			
London Street Tramways (part of) ...	1st March, 1895 ...	4¼ miles ...	Originally leased to the North Metropolitan Tramways Company from June, 1896, until June, 1910. Lease surrendered 31st March, 1906, and lines since worked by the Council.
London Street (remainder) and North Metropolitan Tramways.	24th June, 1896 ...	43½ „ ...	
London Tramways...	1st January, 1899 ...	21⅜ „ ...	Worked by the Council.
South Eastern Metropolitan Tramways ..	1st April, 1902 ...	2½ „ ...	
South London Tramways	22nd November, 1902	13¼ „ ...	
London, Deptford and Greenwich Tramways.	7th July, 1904 ...	6⅛ „ ...	
London, Camberwell and Dulwich Tramways.	15th August, 1904 ...	[2⅛] „ ...	The lines were not worked, and were abandoned and taken up in 1906.
Woolwich and South-East London Tramways.	1st June, 1905 ...	4¾ „ ...	Narrow gauge lines worked by the Council.
London Southern Tramways	2nd October, 1906 ...	5¾ „ ...	Worked by the Council.
B.—New lines :—			
New lines constructed by the Council from time to time.	1902 to 1907	15⅛ „ ...	Details are given later in this report. All the lines except those in Archway Road are worked by the Council.
Total	—	120⅜ miles in operation.	—

(b) *Other Tramways.*

The tramways in London not belonging to the Council, all of which are worked in conjunction with lines outside London, are as follows :—

Name of undertaking.	Approximate length (street miles).	System of traction.	Date of compulsory purchase by Council under Tramways Act, 1870.	Remarks.
Beckenham District Tramways.	⅛ mile	—	1924	These tramways are authorised, but are not yet constructed.
Bexley District Tramways	1⅛ miles	Overhead trolley electric.	1922	The Council has special power (under Act of 1904) to purchase short length of line (150 yards) in High Street, Plumstead, for Beresford Square to Abbey Wood tramways. Negotiations proceeding.
Harrow Road and Paddington Tramways (Metropolitan Electric).	2 miles	Overhead trolley electric.	1907	The Council in November, 1907, decided to purchase. Negotiations proceeding.
Highgate Hill Tramways	½ mile	Cable	1910	The Council decided not to exercise its power of purchase in 1903.
Lea Bridge, Leyton, and Walthamstow Tramways.	⅜ mile	Horse	1911	Question of early purchase by agreement and reconstruction of lines being considered.
London United Tramways	5⅜ miles	Overhead trolley electric.	1909	—
Metropolitan Electric Tramways.	1½ miles	Overhead trolley electric.	1910 and 1930	Dates of purchase fixed by special agreements scheduled to Acts of Parliament.
Total, about ...	11 miles	—	—	

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II.—ELECTRIFICATION AND EXTENSION OF THE COUNCIL'S TRAMWAYS.

Reconstruction and Extension of L.C.C. Tramways.

As indicated above, the Council's tramways now extend over a total of about 120⅜ miles, and the undertaking includes about 68⅝ miles of electric tramways. The remainder are horse tramways. Some of the horse lines are now in course of reconstruction (about 7⅛ miles), and certain new lines are about to be constructed (about 4⅛ miles).

The following table gives in summary form details of the progress made year by year with the electrification and extension of the tramways :—

Street mileage at end of year.	Electric traction (in operation).	Horse traction (including lines in process of reconstruction).	Total.
	Miles.	Miles.	Miles.
1894–5	—	4½	4½
1895–6	—	47½*	47½
1896–7	—	47½*	47½
1897–8	—	47½*	47½
1898–9	—	72½*	72½
1899–1900	—	72½*	72½
1900–1	—	72½*	72½
1901–2	—	72½*	72½
1902–3	(Some lines undergoing reconstruction.)	88½*	88½
1903–4	19½	69½*	88½
1904–5	26½	68½*	95½
1905–6	30⅜	73½*	104
1906–7	58⅞	57⅛	116⅛
14th February, 1908	68⅝	51⅝	120⅜

* The northern tramways (about 47½ miles, later increased to about 48½) were leased to North Metropolitan Tramways Company till 1st April, 1906.

Generally speaking, the electrification of the Council's horse tramways has been, and is being carried out under the general powers conferred by the London County Tramways (Electrical Power) Act, 1900, but in some instances special authority to reconstruct the tramways has been obtained. All new lines, however, are authorised specially.

(a) *Tramways constructed or electrified, or in progress.*

The following table gives details of the various tramways reconstructed, and new lines constructed, by the Council for electric traction, and also particulars of additional tramway works in progress :—

Description of tramways.	Approximate length (street miles).	System of electric traction adopted.	Special authorising Act (if any).	Date of opening for public traffic.	Remarks.
1. Existing lines from Tooting to the termini at Westminster, Waterloo, and Blackfriars Bridges, *via* Balham High Road, Clapham Road, Kennington and "Elephant and Castle."	8½ miles	Conduit	London County Tramways Act, 1900.	15th May, 1903	Lines opened by H.R.H. the Prince of Wales.
2. Reconstruction and doubling of existing lines from Camberwell Green to Vauxhall, *via* Camberwell New Road, &c.; and other short lengths of line in Westminster Bridge Road and Brixton Road.	2 miles	Conduit	London County Council (Tramways and Improvements) Act, 1901.	25th June and 2nd August, 1903.	—
3. Existing lines from "Elephant and Castle" to Greenwich, *via* Old and New Kent Roads, &c., and *via* Walworth Road and Camberwell Road.	9½ miles.	Conduit	—	17th and 24th January, 1904.	—
4. Existing lines in Great Dover Street and Newington Causeway, &c., and certain short extensions and new junctions in Bermondsey and Southwark, including the extensions to Tower Bridge and Southwark Bridge.	3⅞ miles	Conduit	New extensions and junctions—London County Council (Tramways and Improvements) Act, 1901.	Various dates from 1st August to 19th September, 1904.	—
5. Existing lines from Kennington to Streatham terminus, *via* Brixton Road and Hill and Streatham High Road.	3½ miles	Conduit	—	25th May and 19th June, 1904.	These lines were originally worked by cable traction.
6. Extension of Tooting tramways from the former terminus along Tooting High Street to Tooting Broadway and a short distance along Defoe Road.	⅜ mile	Conduit	London County Council (Tramways and Improvements) Act, 1901 (parts of tramways Nos. 12 and 13 in the Act).	8th August, 1905.	Constructed to obtain improved terminal facilities.

(a) *Tramways constructed or electrified, or in progress*—continued.

Description of tramways.	Approximate length (street miles).	System of electric traction adopted.	Special authorising Act (if any).	Date of opening for public traffic.	Remarks.
7. New lines from Archway Tavern, *via* Archway Road, to county boundary beneath Highgate Archway.	¾ mile	Overhead trolley.	London County Council (Tramways and Improvements) Act, 1901.	22nd December, 1905.	These lines are leased to, and worked by, the Metropolitan Electric Tramways, Ltd. (the lessees of the Middlesex County Council light railways).
8. New lines from New Cross Road, *via* Lewisham High Road to the Obelisk, Lewisham.	1½ miles	Conduit	London County Council (Tramways and Improvements) Act, 1904.	30th January, 1906.	—
9. New lines from Aldwych, under Kingsway, to Southampton Row, thence existing lines *via* Theobald's Road, and new lines *via* Rosebery Avenue and St. John Street to the "Angel," Islington.	1¾ miles	Conduit	London County Tramways Act, 1900, and London County Council (Subways and Tramways) Act, 1902.	24th February, 1906.	A portion of these tramways is laid in a subway under Kingsway, &c.
10. Reconstruction and doubling of existing lines from the Obelisk, Lewisham, *via* High Street, Lewisham, to terminus at Rushey Green.	1¼ miles	Conduit	London County Council (Tramways and Improvements) Act, 1904.	10th June, 1906	—
11. New lines from the existing terminus at Greenwich, *via* Woolwich Road and Blackwall Lane, to the Blackwall Tunnel.	1 mile	Conduit	London County Council (Tramways and Improvements) Act, 1904.	17th and 18th June, 1906.	—
12. Existing lines from No. 11, *via* Woolwich Road, as far as Tunnel Avenue.	½ mile	Conduit	—	16th June, 1906	These lines are of standard gauge and have replaced a portion of the old narrow-gauge horse tramways.
13. Existing lines from Victoria Station, *via* Vauxhall Bridge Road, to Vauxhall Bridge.	¾ mile	Conduit	—	Electric traction on 5th August, 1906; horse traction on 26th May, 1906.	The Vauxhall Bridge Road lines are worked in conjunction with the lines over Vauxhall Bridge. Powers to employ electric traction on the Vauxhall Bridge lines were obtained in 1906. The new Vauxhall Bridge was opened on the 26th May, 1906.
14. New lines across Vauxhall Bridge	¾ mile	Conduit	London County Council (Vauxhall Bridge Tramways) Act, 1896, and London County Council (Tramways and Improvements) Act, 1906.		
15. New lines from Defoe Road, Tooting, *via* Garratt Lane, South Street, Red Lion Street, and York Road, to the existing lines at North Street.	2½ miles	Conduit	London County Council (Tramways and Improvements) Act, 1901 (remainder of Tramway No. 12 in the Act).	5th August, 1906	—
16. Existing lines from Westminster Bridge and St. George's Circus, *via* Albert Embankment, Lambeth Road, Nine Elms Lane, Battersea Park Road, and York Road, to join the new lines (No. 15) at North Street; including the existing lines in Falcon Road, Battersea.	6¼ miles	Conduit	—	North Street to Creek Road, 5th August, 1906; Albert Embankment, 8th September, 1906; Lambeth Road, 24th September, 1906; Creek Road to Queen's Road and lines in Falcon Road, 13th October, 1906; Queen's Road, to Albert Embankment, 22nd December, 1906.	Certain doublings, &c., which have been carried out were authorised by the London County Tramways Act, 1900, and the London County Council (Tramways and Improvements) Act, 1901.
17. Existing tramways from the "Angel," Islington, to Highbury (N.L.R.) station, *via* Upper Street.	1 mile	Conduit	—	16th November, 1906.	See note on Nos. 22 to 24 in this list.
18. New lines from Camberwell Green, *via* Denmark Hill, Champion Park, Grove Lane, Dog Kennel Hill, Grove Vale and Lordship Lane, to its junction with Crystal Palace Road.	2¼ miles	Conduit	London County Council (Tramways and Improvements) Act, 1902.	19th November, 1906.	—
19. Extension of above lines (No. 18) to Dulwich Library.	¼ mile	Conduit	London County Council (Tramways and Improvements) Act, 1904.		This is part of the authorised lines to Forest Hill.

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Reconstruction and Extension of L.C.C. Tramways.

(a) *Tramways constructed or electrified, or in progress*—continued.

Description of tramways.	Approximate length (street miles).	System of electric traction adopted.	Special authorising Act (if any).	Date of opening for public traffic.	Remarks.
20. New lines from former terminus in Westminster Bridge Road, *via* Westminster Bridge and Victoria Embankment, to John Carpenter Street.	1 7/16 miles	Conduit	London County Council (Tramways and Improvements) Act, 1906.	15th December, 1906.	The City Corporation has obtained powers to widen Blackfriars Bridge and to construct tramways over the widened portion. These tramways, subject to certain terms to be arranged, will be worked by the Council as part of its system.
21. New lines from existing lines in Stangate, *via* that thoroughfare, to join new lines on Westminster Bridge.	1/16 mile	Conduit	London County Council (Tramways and Improvements) Act, 1906.	4th February, 1907.	—
22. Existing lines— (*a*) From Theobald's Road (No. 9 in this list), *via* Clerkenwell Road, Old Street, Great Eastern Street, Commercial Street, and Leman Street, to the London Docks. (*b*) From Norton Folgate, *via* High Street, Shoreditch, Kingsland Road, High Street and Stoke Newington Road, to Stamford Hill. (*c*) From Aldgate, *via* Commercial Road, Commercial Road East, and East India Dock Road, to Poplar. (*d*) From Moorgate Street, *via* Finsbury Pavement and City Road, to Old Street. (*e*) From Holborn, *via* Gray's Inn Road, to Theobald's Road. (*f*) From Great Eastern Street, *via* Old Street, to Shoreditch Church.	About 11 miles.	Conduit	—	Aldgate to Poplar on 15th December, 1906; Holborn to Aldgate on 16th January, 1907; Shoreditch to Stamford Hill, 6th February, 1907; remaining short lengths on 29th March and 9th April, 1907.	With the exception of Theobald's Road (No. 9 in this list), these lines, and those in Upper Street (No. 17 in this list), were the first sections of the northern lines to be reconstructed, and the work was taken in hand very soon after the lease of the North Metropolitan Tramways Company was surrendered on 1st April, 1906.
23. Approach line to the Poplar car-shed, *via* Aberfeldy Street, &c.	¾ mile (included above).	Conduit	London County Council (Tramways and Improvements) Act, 1906.		
24. Approach line to the Stamford Hill car-shed, *via* Egerton Road.	¼ mile (included above).	Conduit	London County Council (Tramways and Improvements) Act, 1901 (General power).		
25. New lines from existing tramways in High Street, Lewisham, *via* Lee High Road to Lee Green.	1 mile	Conduit	London County Council (Tramways and Improvements) Act, 1904.	4th May, 1907	—
26. Existing lines from Shoreditch Church to Cambridge Heath, *via* Hackney Road.	1 mile	Conduit	—	18th May, 1907	—
27. Existing lines from Old Street to the "Angel," Islington, *via* City Road.	¾ mile	Conduit	—	29th July, 1907	—
28. Existing lines from Grays Inn Road to the "Angel," Islington, *via* Pentonville Road.	¾ mile	Conduit	—	29th July, 1907	—
29. New lines from Rosebery Avenue to St. John's Lane, *via* St. John Street.	¾ mile	Conduit	London County Tramways Act, 1900, and London County Council (Tramways and Improvements) Act, 1906.	29th July, 1907	Originally authorised in 1900, but only a small portion constructed. Remaining portion reauthorised in 1906.
30. Extension of tramways from Tooting Broadway to the county boundary near Longley Road, *via* Tooting, High Street.	¾ mile	Conduit	London County Council (Tramways and Improvements) Act, 1901. (Remainder of tramways No. 13 in the Act).	13th October, 1907.	These lines meet the London United Tramways near the county boundary.
31. New lines from Tooting High Street to the county boundary at Tooting Junction, *via* Mitcham Road.	¾ mile	Conduit	London County Council (Tramways and Improvements) Act, 1906.	13th October, 1907.	These lines meet the South Metropolitan Tramways near the county boundary.

(a) *Tramways constructed or electrified, or in progress*—continued.

Description of tramways.	Approximate length (street miles).	System of electric traction adopted.	Special authorising Act (if any).	Date of opening for public traffic.	Remarks.
32. Existing lines from Aldersgate Street to the "Angel," Islington, *via* Goswell Road.	½ mile	Conduit	—	27th November, 1907	The single line portion of these tramways was reconstructed as a double line under the London County Tramways Act, 1900.
33. Existing lines from Highbury (N.L.R.) station to the Archway Tavern, *via* Holloway Road.	2 miles	Conduit	—	28th November, 1907.	—
34. New lines from Grove Vale, *via* Goose Green and Peckham Rye, to Stuart's Road, Peckham.	1 mile	Conduit	London County Council (Tramways and Improvements) Act, 1904.	28th November, 1907.	—
35. Existing lines from Theobald's Road to Pentonville Road, *via* Gray's Inn Road.	¼ mile	Conduit	—	5th December, 1907.	—
Total of electric lines now in operation	About 68¾ miles.				

In addition to the above tramways, the under-mentioned lines are now being dealt with :—

1. Existing lines from Vauxhall Station, *via* South Lambeth Road and Stockwell Road, to Brixton Road, including new junctions (authorised in 1907) to Clapham Road and Brixton Road.	1¼ miles	Conduit	London County Council (Tramways and Improvements) Act, 1907.	—	Part of the London southern system purchased in 1906. Nearly completed.
2. Existing lines from Greenwich Station, *via* South Street and Lewisham Road, to the Obelisk, Lewisham.	½ mile	Conduit	—	—	Nearly completed.
3. Reconstruction and partial doubling of existing lines from Beresford Square to Bexley tramways at Plumstead, *via* Plumstead Road and High Street, Plumstead.	1½ miles	Overhead	London County Council (Tramways and Improvements) Act, 1904.	—	In course of reconstruction. These lines will be of standard gauge and will replace the narrow-gauge horse tramways.
4. New lines from Bexley tramways at Wickham Lane, *via* Bostall Hill, McLeod Road, Basildon Road, Bostall Lane, and Knee Hill, to the county boundary at Abbey Wood.	1 mile	Overhead	London County Council (Tramways and Improvements) Act, 1904.	—	About to be commenced. Negotiations proceeding for purchase of short length of Bexley tramways in High Street, Plumstead, so as to get a through route from Beresford Square to Abbey Wood.
5. Existing lines from Gardiner's Corner, *via* Whitechapel Road, Mile End Road and Bow Road, to the county boundary at Bow Bridge.	3 miles	"G.B." surface contact.	—	—	This is the first case of the installation of the "G.B." system of traction in London, and is intended to test the efficiency of that system under the conditions of London traffic.
6. New lines from Harlesden, *via* Scrubs Lane, Wood Lane, Shepherd's Bush Road and Brook Green Road, to Hammersmith Broadway.	3 miles	Overhead	London County Council (Tramways and Improvements) Act, 1903.	—	About to be commenced.
7. New subway lines between existing lines on Victoria Embankment and those in the tramway subway at the Strand.	¼ mile	Conduit	London County Council (Tramways and Improvements) Act, 1906.	—	The subway to the Victoria Embankment authorised under the Acts of 1902 and 1906 is almost completed. The construction of the tramways is being commenced, and, when completed, they will connect the northern and southern tramways systems.
Total works now in progress ...	About 11¼ miles.				

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New L.C.C. Tramways authorised.

(b) *New tramways authorised, but not commenced.*

The tramways which the Council has from time to time obtained authority to construct, but not commenced, are shown in the following tables :—

(1) *Summary of lengths of new tramways authorised by the several Acts obtained by the Council, which include powers not yet exercised :—*

Title of Act.	Total length.			Length not yet dealt with.		
	Double line.	Single line.	Total.	Double line.	Single line.	Total.
	m. f. ch.	m. f. ch.	m. f. ch.	m. f. ch	m. f. ch.	m. f. ch.
London County Council (Tramways and Improvements) Act, 1901.	5 4 5·89	0 1 3·40	5 5 9·29	0 5 3·35	0 1 3·40	0 6 6·75
London County Council (Tramways and Improvements) Act, 1902 (as amended by Act of 1904).	6 3 1·23	1 2 0·52	7 5 1·75	4 1 6·85	1 1 3·40	5 3 0·25
London County Council (Tramways and Improvements) Act, 1903.	3 3 7·85	—	3 3 7·85	0 4 3·00	—	0 4 3·00
London County Council (Tramways and Improvements) Act, 1904 (as amended by Act of 1906).	10 0 4·47	0 4 3·20	10 4 7·67	3 2 4·47	0 0 2·90	3 2 7·37
London County Council (Tramways and Improvements) Act, 1906.	6 1 0·50	0 2 5·05	6 3 5·55	2 2 4·10	1 1 1·50	3 3 5·60
London County Council (Tramways and Improvements) Act, 1907.	0 1 9·20	0 3 6·70	0 5 5·90	0 1 4·90	0 3 6·70	0 5 1·60
Totals	31 6 9·14	2 5 8·87	34 4 8·01	11 1 6·67	2 7 7·90	14 1 4·57

Other lines (about 5⅜ miles, north of the Thames) were authorised by the London County Tramways Act, 1900. About 2⅞ miles of these lines have been constructed, and the powers in respect of the remainder lapsed in 1905. Some of the latter schemes (about 1½ miles) were re-authorised in 1906, and are included in the above return.

(2) *Details of new tramways authorised by the Acts referred to in the foregoing table* (1), *but not yet constructed :—*

Number of tramways in Act, and description of tramways.	Authorising Act.	Length.			Remarks.
		Double line.	Single line.	Total.	
		m. f. ch.	m. f. ch.	m. f. ch.	
1A. Junction between tramways in Archway Road and Junction Road.	London County Council (Tramways and Improvements) Act, 1901.	0 0 1·30	—	0 0 1·30	—
3. Junction between tramways in Balls Pond Road and Mildmay Park Road.	Ditto	0 0 0·75	—	0 0 0·75	—
15 and 15A. Existing lines in Battersea Park Road, *via* Albert Road, to southern end of Albert Bridge.	Ditto	0 4 8·75	—	0 4 8·75	—
16A. Westminster Bridge Road, *via* Lambeth Palace Road, to existing lines in Stangate.	Ditto	—	0 1 1·15	0 1 1·15	—
19A. Junction between tramways in Newington Butts and Newington Causeway.	Ditto	0 0 1·30	—	0 0 1·30	—
24A. Junction between tramways in Bermondsey New Road and Old Kent Road.	Ditto	0 0 1·25	—	0 0 1·25	—
25. Junction between tramways in St. James's Road and Old Kent Road.	Ditto	—	0 0 1·17	0 0 1·17	—
25A. Further junction between tramways in St James's Road and Old Kent Road.	Ditto	—	0 0 1·08	0 0 1·08	—
5. Hammersmith Broadway, *via* Queen Street, Fulham Palace Road, High Street, and Putney Bridge, to Lower Richmond Road.	London County Council (Tramways and Improvements) Act, 1902.	2 0 5·40	—	2 0 5·40	Powers for use of overhead trolley traction being sought in Bill of 1908.
12, 12A, 12B, 12C, 12D, 14 and 14A. High Street, Eltham, *via* Wellhall Lane and Woolwich Road, to Beresford Square, Woolwich.	Ditto	2 3 5·45 (now reduced to 2 1 1·45 under Act of 1904).	1 1 3·40	3 2 4·85	The lines for a short distance are authorised to be constructed along a diverted route, and the original route 2 f. 4 ch.) is abandoned. See also tramways No. 9 in Act of 1904.
4 and 4A. Hammersmith Broadway, *via* Bridge Road, to near the northern end of Hammersmith Bridge.	London County Council (Tramways and Improvements) Act, 1903.	0 2 4·50	—	0 2 4·50	—
6 and 6A. Garratt Lane, Wandsworth, *via* Wimbledon Road, to the county boundary.	Ditto	0 1 8·50	—	0 1 8·50	The tramways will meet the London United Tramways at the county boundary.

(b) *New Tramways authorised, but not yet constructed*—continued.

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New L.C.C. Tramways authorised.

Number of tramways in Act, and description of tramways.	Authorising Act.	Length. Double line.	Single line.	Total.	Remarks.
		m. f. ch.	m. f. ch.	m. f. ch.	
4B. Junction between Crystal Palace Road and the new tramways in East Dulwich Road.	London County Council (Tramways and Improvements) Act, 1904.	0 0 1·00	—	0 0 1·00	These junctions are not now necessary, as the old horse lines in Crystal Palace Road and East Dulwich Road have been abandoned.
4C. Junction between East Dulwich Road and the new tramways in Peckham Rye.	Ditto	0 0 1·07	—	0 0 1·07	
9. Diversion of portion of authorised tramways in Wellhall Road, *via* a new road, to High Street, Eltham.	Ditto	0 2 5·00	—	0 2 5·00	See tramways Nos. 12 to 14A in Act of 1904.
10 (part). Dulwich Library, *via* Lordship Lane and London Road, to Dartmouth Road, Forest Hill.	Ditto	1 1 3·30	—	1 1 3·30	A portion of tramways No. 10 authorised in 1904, namely, the portion from Crystal Palace Road to Dulwich Library (1 f.), was constructed with the lines from Camberwell Green to Crystal Palace Road, and opened on 19th November, 1906.
11 and 11A. Stanstead Road, Lewisham, *via* Brockley Lane, and Malpas Road, to Lewisham High Road.	Ditto	2 6 0·30 (now reduced to 1 6 4·10 under Act of 1906).	—	1 6 4·10	To avoid certain street widenings, powers have been obtained to construct a portion of the tramways along Stondon Park instead of Brockley Rise, a saving in length of 2 ch., and to construct one of the tramway tracks along Shardeloes Road and the other along Malpas Road, instead of both along Malpas Road (4 f. 4·2 ch.). See also tramways Nos. 19, 20A and 20B in Act of 1906.
15A. Junction line in Beresford Square, Woolwich.	Ditto	—	0 0 1·80	0 0 1·80	—
15B. Junction line between tramways in New Road and Plumstead Road.	Ditto	—	0 0 1·10	0 0 1·10	—
2. High Street, Camden Town, *via* Crowndale Road, to Pancras Road.	London County Council (Tramways and Improvements) Act, 1906.	0 2 3·10	—	0 2 3·10	Originally authorised in 1900, but powers lapsed.
10. Existing lines in East India Dock Road, *via* that thoroughfare, to the county boundary at Barking Road Bridge.	Ditto	0 4 5·55	—	0 4 5·55	Originally authorised in 1900, but powers lapsed. A short portion of single line has been constructed along this route as part of the approach line to Poplar car-shed.
13 (part). Remainder of authorised lines along Victoria Embankment, eastward of John Carpenter Street.	Ditto	0 0 4·00	—	0 0 4·00	These are connections of existing lines with the new lines to be constructed on Blackfriars Bridge by the City Corporation. They are not to be constructed until the bridge has been widened by the Corporation. The bridge works are now in progress.
14. Along Blackfriars Road, from Upper Ground Street to Stamford Street.	Ditto	0 0 5·00	—	0 0 5·00	
15 and 15A. Existing lines at junction of Lavender Hill and Queen's Road, *via* Cedars Road and Clapham Common, to existing lines at "Plough," Clapham.	Ditto	0 6 4·85	—	0 6 4·85	The construction of these lines is not to be commenced until the electrification of the tramways in Wandsworth Road, Queen's Road and Lavender Hill is also commenced.
18. County boundary at Upper Norwood, *via* Church Road and Crystal Palace Parade, to the high level entrance to the Crystal Palace.	Ditto	0 1 1·60	—	0 1 1·60	These lines will meet tramways outside London at the county boundary.
19. Along Stondon Park ...	Ditto	0 3 0	—	0 3 0	Diversion of tramways in Brockley Rise (3 f. 2 ch.). See tramways No. 11 in Act of 1904.
20A. Along Shardeloes Road ...	Ditto	—	0 4 7·30	0 4 7·30	Single loop lines on the authorised Lewisham High Road to Forest Hill tramways to avoid street widenings. See tramways Nos. 11 and 11A in Act of 1904.
20B. Along Malpas Road ...	Ditto	—	0 4 4·20	0 4 4·20	
12. Coldharbour Lane, *via* Herne Hill Road and Wanless Road, to Hinton Road.	London County Council (Tramways and Improvements) Act, 1907.	0 1 4·90	—	0 1 4·90	These lines are required for the electrification of the "London Southern" Tramways system, which is specially authorised by this Act.
13. Single loop line along Poplar Walk and Lowden Road.	Ditto	—	0 3 6·70	0 3 6·70	A portion of the work is in hand, and the question of proceeding at an early date with the remainder is being considered.
Totals	... ...	11 1 6·67	2 7 7·90	14 1 4·57	

Mr. G. L. Gomme.

L.C.C. Horse Tramways.

(c) *Existing tramways not yet electrified.*

The remaining horse tramways of the Council, the electrification of which has not yet been commenced, are as follows:—

Description of tramways.	When acquired, &c.	Approximate length (street miles).	Remarks.
1. King's Cross, *via* Caledonian Road, to Holloway Road	Leased from June, 1896, to 1st April, 1906.	1¼ miles	The electrification of these tramways on the conduit system is to be put in hand almost immediately.
2. Holloway Road, *via* Seven Sisters Road, to Finsbury Park.	Ditto	¾ mile	
3. Whitechapel Road, *via* Cambridge Road, Mare Street, and Lower and Upper Clapton Roads, to Stamford Hill.	Ditto	4¼ miles	—
4. Euston Road, *via* Hampstead Road, High Street, Camden Town, Chalk Farm Road. Ferdinand Street, Malden Road, Southampton Road, Fleet Road, Constantine Road, and Agincourt Road, to Hampstead Heath.	Ditto	2¾ miles	—
5. "Britannia," *via* Camden Road and Parkhurst Road, to Holloway Road.	Ditto	1⅛ miles	—
6. King's Cross, *via* Euston Road. Pancras Road, and Great College Street, to Prince of Wales Road.	Ditto	1½ miles	—
7. Malden Road, *via* Prince of Wales Road, to Kentish Town Road.	Ditto	⅜ mile	—
8. Prince of Wales Road, *via* Kentish Town Road and Junction Road, to Archway Tavern.	Ditto	1⅛ miles	—
9. "Britannia," *via* Kentish Town Road (part), to Great College Street.	Ditto	⅜ mile	—
10. Kentish Town Road, *via* Highgate Road, to Swain's Lane.	Ditto	⅞ mile	—
11. High Street, Islington, *via* Liverpool Road, to Holloway Road.	Ditto	1¼ miles	—
12. Upper Street, *via* Essex Road, Balls Pond Road and Lane, and Graham Road, to Mare Street.	Ditto	2⅛ miles	—
13. Clerkenwell Road, *via* Farringdon Road, and King's Cross Road, to Pentonville Road.	Ditto	⅞ mile	—
14. City Road, *via* East Road, New North Road and Canonbury Road, to Highbury Station.	Ditto	1⅛ miles	—
15. New North Road, *via* Bridport Place, Southgate Road, Mildmay Park, and Green Lanes, to Finsbury Park (Manor House).	Ditto	2⅞ miles	—
16. East India Dock Road (including short line in West India Dock Road), *via* Burdett Road and Cassland Road, to Victoria Park.	Ditto	2⅛ miles	—
17. Nine Elms Lane, *via* Wandsworth Road, Lavender Hill and St. John's Hill, to East Hill, Wandsworth.	22nd November, 1902.	3¼ miles	—
18. Lavender Hill, *via* Queen's Road and Victoria Road, to Chelsea Bridge.	Ditto	1¼ miles	—
19. Tooley Street (London Bridge). *via* Tooley Street, Jamaica Road, Union Road, Deptford Lower Road and Evelyn Street, to High Street, Deptford.	7th July, 1904 ...	3¼ miles	—
20. Tower Bridge Road. *via* Grange Road and Southwark Park Road, to Rotherhithe New Road.	Ditto	1¼ miles	—
21. Old Kent Road, *via* Rotherhithe New Road, to Deptford Lower Road.	Ditto	1⅛ miles	—
22. Grange Road, *via* Spa Road, to Jamaica Road ...	Ditto	½ mile	—
23. Tunnel Avenue, Greenwich, *via* Greenwich and Woolwich Lower Roads, George Street, Church Street, High Street, Market Street and Beresford Street, to Beresford Square, Woolwich.	1st June, 1905 ...	2⅝ miles	These tramways are of narrow gauge (3 ft. 6 in.).
24. Brixton Road, *via* Gresham Road and Coldharbour Lane, to Denmark Hill.	2nd October, 1906	1¼ miles	Special powers to electrify these lines, part of what was formerly known as the London Southern Tramways, on the overhead trolley system, were obtained by Act of 1907. Question of early reconstruction of the lines being considered.
25. Coldharbour Lane, *via* Milkwood Road and Norwood Road, to Norwood Cemetery.	Ditto	2¼ miles	
26. Gresham Road, *via* Coldharbour Lane, to Brixton Road.	Ditto	¼ mile	—
Total length, about ...	... ...	44⅜ miles	

G. L. Gomme,
Clerk of the Council.

County Hall,
Spring Gardens, S.W.
14*th February*, 1908.

APPENDIX C.—III.

MR. A. L. C. FELL. L.C.C. Tramways.

Particulars as to London traffic submitted by the Chief Officer of Tramways, London County Council.

London County Council Tramways.

(1) *Lengths of Tramways.*—At the present date the following lengths of tramways are : (*a*) operated by horse or electric traction (excluding leased lines in Archway Road) ; (*b*) under construction or reconstruction ; (*c*) authorised but not yet constructed.

—	Electric. (Miles of single line.)	Horse. (Miles of single line.)	Total. (Miles of single line.)
(*a*) At present in operation	133·40	80·72	214·12
(*b*) Under construction or reconstruction...	21·95	—	21·95
(*c*) The length of tramway authorised but not yet constructed.	—	—	25·38

(2) *Receipts, passengers carried, and miles run by cars.*—The following is a comparative statement showing the receipts, passengers carried, and miles run by the Council's cars for the years 1904–5, 1905–6, 1906–7, and also similar particulars for the period from 1st April, 1907, to 25th January, 1908 (300 days) :—

—	1904–5.	1905–6.	1906–7.	From 1st April, 1907, to 25th January, 1908. (300 days.)
Number of passengers carried ...	164,818,560	183,512,421	314,227,090	306,728,412
Total mileage run by cars ...	14,081,397	15,578,793	30,130,297	29,059,148
Total receipts	£682,095	£782,210	£1,414,604	£1,340,884

—	Electric.	Horse.
Average number of passengers per car mile during the year ended 31st December, 1907	10·95	9·39
Average passenger receipts per car mile during the year ended 31st December, 1907 ...	11·79d.	9·20d.

It should be noted that not only has the length of the tramways owned by the Council been greatly increased since the previous information was supplied, but electric traction has been introduced on a large number of the routes. The tramways have, however, not been working up to their full capacity, as the whole system has been, and is still, greatly disorganised owing to the reconstruction of the horse tramways for electric traction.

Effect of electrification of tramways.

As an example to show the effect of the introduction of electric traction on a route previously worked by horse traction, a comparison of the passengers carried by horse traction on the Stamford Hill route for the month of April, 1906, and by electric traction for the month of April, 1907, may be of interest. Since April, 1907, there has been a marked increase in the number of passengers carried on this route, as is shown by the figures for the month of September, 1907. The Stamford Hill route was opened for electric traction on 6th February, 1907.

Number of passengers carried on the Stamford Hill route—

By horse cars for the month of April, 1906 1,300,488
By electric cars for the month of April, 1907 1,753,512
By electric cars for the month of September, 1907 ... 2,348,441

Workmen's cars.

The following table shows the number of workmen carried on the Council's tramways and the miles run by cars carrying workmen :—

—	1904–5.	1905–6.	1906–7.	From 1st April, 1907, to 25th January, 1908. (300 days.)
Passengers carried	9,898,289	13,011,473	19,528,799	22,805,477
Miles run by cars	—	1,477,997	2,200,090	2,755,251

MR. A. L. C. FELL. L.C.C. Tramways.

As an example, the following comparison of the number of workmen carried on the Tooting route during the year 1902–3, with the number carried during the year 1906–7, shows the enormous development which has taken place, and emphasises the fact that adequate accommodation and increased speeds on the Council's tramways has made it possible for workmen to live a considerable distance away from their work—

Tooting workmen passengers, 1902–3	581,626
Tooting workmen passengers, 1906–7	3,342,277

Seating accommodation on electric cars.

I attach hereto diagram "A," (1) showing the proportion of passengers to the seating accommodation on the cars leaving the Embankment between 5 p.m. and 9 p.m. on 13th January, 1908. The observations were taken when the cars were passing over Westminster Bridge.

Diagram "B" (1) records similar information based on observations taken in Westminster Bridge Road at York Road on the same day and between the same hours.

Variations of tramway load.

Diagram "C," (1) attached hereto, shows the variations of the tramway load during the course of an average day. Owing to the peculiar conditions of traffic in London it is necessary at the present time to run in nearly 40 per cent. of cars between the hours of 10 a.m. and 4 p.m. This is a case where the use of trailer cars would be very advantageous, as it would then be possible to run a constant service on many of the routes, simply reducing the seating accommodation by running the trailers into the depôts in the middle of the day. Diagram "D," (1) attached hereto, shows in diagrammatic form the number of passengers carried weekly between 1st January, 1907, and 31st December, 1907.

Fares and fare stages.

With regard to the tables of fares and fare stages, I attach hereto a copy of the revised particulars (2), but as these are now under consideration of the Highways Committee, it is inadvisable to publish these particulars at the present time, as it is proposed to make certain modifications very shortly.

Rolling stock.

The Council has in operation, or in process of construction, 1,050 electric cars. The types of the car bodies, trucks and equipments, together with the classification numbers, are as follows :—

100 cars are of the double-deck type (Class B) mounted on single four-wheel trucks and equipped with 25 b.h.p. motors. The seating capacity of these cars is 56.

100 cars are of the double-deck type (Class C) mounted on single four-wheel trucks and equipped with 30 b.h.p. motors. The seating capacity of these cars is also 56.

100 cars are of the double-deck type (Class A) mounted on side bearing maximum traction trucks and equipped with 35 b.h.p. motors. The seating capacity of these cars is 66.

100 cars are of the double-deck type (Class D) mounted on side bearing maximum traction trucks and equipped with 30 b.h.p. motors. The seating capacity of these cars is 66.

50 cars are of the single-deck type (Classes F and G). They are of steel construction for use on the subway tramways. All timber, cable, &c., used on these cars is non-inflammable They are mounted on swing bolster maximum traction trucks and equipped with 35 and 42 b.h.p. motors. The seating capacity is 36.

300 cars are of the double-deck type (Class E) and mounted on centre bearing swing bolster maximum traction trucks and equipped with 42 b.h.p. motors. The seating capacity of these cars is 72.

300 cars are of the double-deck type (Class E.I.). They are mounted on centre bearing swing bolster minimum traction trucks and equipped with 42 b.h.p. motors. The seating capacity of these cars is 78.

All cars are either fitted or under contract to be fitted with magnetic brakes. These act upon the track and in the case of 900 of the cars apply the wheel brakes simultaneously.

At present on the London County Council Tramways 733 electric and 300 horse cars are being run. If the 300 horse cars were supplanted by electric cars, the number of the latter required, with their increased seating capacity and increased speed, would only be 128, thus greatly reducing the congestion of traffic in the thoroughfares through which these horse cars are being run.

A. L. C. FELL,
Chief Officer.

1*st February*, 1908.

(1) These Diagrams have not been reproduced.
(2) Not received.

APPENDIX C—IV.

MR. EDGAR HARPER.

LOCOMOTION AND TRAFFIC.

Statistics in continuation of certain statistics submitted to the Royal Commission on London Traffic by the Statistical Officer of the London County Council.

Passenger Traffic in Greater London.

PASSENGER TRAFFIC IN GREATER LONDON.

1. Table showing the number of passengers carried by the local railways, the tramways, and by the chief omnibus companies in Greater London in each quinquennial year between 1867 and 1901 and in each subsequent year.

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 5, page 127.
N.B.—The new figures are printed in *italics*.

Year.	Number of passengers carried by				Estimated population of Greater London.	Number of journeys per head.
	Railway (local companies).	Tramway (approximate).	Omnibus (two principal companies).	Total (approximate).		
1867	40,547,398	Not available	41,424,423	81,971,826	3,605,510	22·7
1871	72,636,313		43,556,545	116,192,858	3,885,641	29·9
1876	115,326,889		51,157,946	166,484,835	4,303,668	38·6
1881	139,233,690	72,038,962	58,389,997	269,662,649	4,766,661	56·6
1886	165,050,887	132,529,504	90,708,966	388,289,357	5,182,130	74·9
1891	180,026,117	198,569,584	158,926,250	537,521,951	5,633,806	95·4
1896	189,584,863	279,518,865	212,628,471	681,732,199	6,124,812	111·3
1901	236,506,162	340,772,414	269,933,759	847,212,335	6,581,372	128·7
1902	277,110,930	361,170,652	279,466,557	917,748,139	6,705,770	136·9
1903	*290,722,680*	*394,356,531*	*287,386,471*	*972,465,682*	*6,806,296*	*142·9*
1904	*298,638,750*	*431,813,839*	*288,965,214*	*1,019,417,803*	*6,907,756*	*147·6*
1905	*305,052,495*	*477,944,684*	*290,665,051*	*1,073,662,230*	*7,010,171*	*153·2*
1906	*329,521,648*	*508,700,269*	*291,563,048*	*1,129,784,965*	*7,113,560*	*158·8*
1907	*363,794,894*	*585,695,285*	(a) *331,350,000*	*1,280,840,179*	*7,217,939*	(a)*177·5*

(a) The number carried by the Vanguard Motor Omnibus Company is added to that of the two principal companies for 1907.

FARES ON LONDON RAILWAYS.

Railway Fares.

2. Table showing the average mileage rate of the third class fares, the workmen's fares and the "cheap" fares in December, 1907, to each terminus, for distances not exceeding twenty miles, calculated on the longest distance for each fare on each branch of the several railways.

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 40, page 174.

Railway.	Average mileage rate.		
	Third class return fares.	Workmen's fares.	"Cheap" fares.
	d.	*d.*	*d.*
North London	·41	·17	—
Metropolitan District—			
Mansion House	·48	·22	—
Whitechapel	·48	·24	—
Metropolitan—			
Aldgate	·51	·22	—
Baker Street	·63	·22	—
London, Tilbury and Southend	·62	·22	—
Great Central	·64	·22	—
London and North Western	·65	·31	—
Midland—			
Moorgate Street	·65	·22	—
St. Pancras	·77	·23	—
Great Eastern—			
Fenchurch Street...	·66	·24	·31
Liverpool Street	·72	·17	·34
Great Northern—			
Moorgate Street	·66	·25	·36
King's Cross	·78	·27	·44
Great Western	·67	·24	—
South Eastern and Chatham—			
Ludgate Hill	·73	·23	—
Victoria	·77	·24	—
Charing Cross	·85	·25	—
Cannon Street	·88	·28	—
London, Brighton and South Coast—			
London Bridge	·74	·24	—
Victoria	·78	·25	—
London and South Western	·78	·29	—
Tube Railways—			
Central London	·57	·17	—
City and South London	·60	·22	—
Great Northern, Piccadilly and Brompton	·61	·23	—
Great Northern and City	·64	·29	—
Charing Cross, Euston and Hampstead	·67	·20	—
Baker Street and Waterloo	·81	·21	—
Waterloo and City	1·00	·67	—

MR. EDGAR HARPER.

Workmen's Trains.

WORKMEN'S TRAINS.

3. Table showing the number and mileage of workmen's and "cheap" trains run each week-day morning in the London district (December, 1907).

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 41, page 174.

Railway.	Total number of trains run daily.					Number of miles run daily by trains.					Percentage of total mileage run by each company.
	Inwards (to termini).	Outwards (from termini).	Trains whose route is both inwards and outwards.	Local.	Total.	Inwards (to termini).	Outwards (from termini).	Trains whose route is both inwards and outwards.	Local.	Total.	
INWARD AND OUTWARD SERVICE.	1. WORKMEN'S TRAINS.										
South Eastern and Chatham.	53	47	16	22	133	568·71	443·18	116·31	140·55	1,268·75	13·1
Metropolitan	59	52	30	13	154	465·21	412·70	274·25	80·46	1,232·62	12·8
Metropolitan District ...	10	2	48	58	118	108·44	19·59	637·96	284·60	1,050·59	10·9
London and South Western.	42	23	—	21	86	479·84	311·85	—	108·77	900·46	9·3
London, Brighton and South Coast.	38	21	15	4	78	325·44	189·71	155·27	20·60	691·02	7·2
London and North Western.	13	3	—	2	18	186·05	44·94	—	19·76	250·75	2·6
North London	25	15	—	1	41	145·58	94·58	—	3·51	243·67	2·5
Great Western	8	5	—	1	14	93·00	79·87	—	6·77	184·64	1·9
Great Central	4	8	—	—	12	35·64	141·42	—	—	177·06	1·8
Midland	8	3	—	—	11	100·45	33·12	—	—	133·57	1·4
London, Tilbury and Southend.	12	2	—	—	14	84·21	43·15	—	—	127·36	1·3
Tube Railways.											
Charing Cross, Euston and Hampstead.	66	68	—	—	134	309·13	323·80	—	—	632·93	6·6
City and South London	—	—	81	—	81	—	—	603·45	—	603·45	6·2
Great Northern, Piccadilly and Brompton.	—	—	58	75	133	—	—	515·62	29·25	544·87	5·6
Baker Street and Waterloo.	—	—	93	—	93	—	—	395·25	—	395·25	4·1
Central London	31	21	—	—	52	178·25	120·75	—	—	299·00	3·1
Great Northern and City	23	24	—	—	47	79·12	82·56	—	—	161·68	1·7
Waterloo and City ...	13	13	—	—	26	19·50	19·50	—	—	39·00	·4
Inward Service only.											
Great Eastern	67	(*a*) 2	—	38	107	443·14	(*a*) 8·92	—	121·26	573·32	5·9
Great Northern	16	—	—	—	16	154·43	—	—	—	154·43	1·6
Totals	488	309	341	235	1,373	3,781·14	2,369·64	2,698·11	815·53	9,664·42	100·0
INWARD AND OUTWARD SERVICE.	2. "CHEAP" TRAINS.										
Great Eastern	61	54	1	9	125	418·34	461·71	9·45	63·62	953·12	70·6
Great Northern	11	21	—	(*b*) 13	45	99·09	149·09	—	(*b*) 73·76	321·94	23·9
Metropolitan District ...	3	1	9	11	24	15·86	1·86	29·43	26·77	73·92	5·5
Totals	75	76	10	33	194	533·29	612·66	38·88	164·15	1,348·98	100·0

(*a*) These trains are run over the East London line from Liverpool Street.

(*b*) Including North London trains running over the Great Northern's lines—9 trains; 52·56 miles.

[Figures for the Tube Railways are estimated.]

SPEED OF TRAINS.

MR. EDGAR HARPER.

Speed of Trains.

4. Table showing approximately the speed at which passengers are carried on railways in the London district (December, 1907).

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 44, pages 178-9.

(1.) *Underground Railways.*

Railway.	Total length.	Number of intermediate stations.	Time for journey.	Approximate speed per hour.
	Miles.		Minutes.	Miles.
Waterloo and City	1·50	Nil	4	22·5
Great Northern, Piccadilly and Brompton—				
Finsbury Park—Hammersmith	8·89	19	32	16·7
Baker Street and Waterloo	4·25	9	16	15·9
Great Northern and City	3·44	4	13	15·9
Central London	5·75	11	22	15·7
Metropolitan and District—				
Inner Circle	13·00	26	50	15·6
Metropolitan District—				
Ealing—Whitechapel	12·74	24	51	15·0
City and South London	7·45	13	30	14·9
Charing Cross, Euston and Hampstead—				
Charing Cross—Golder's Green	5·93	10	24	14·8
Charing Cross—Highgate	4·28	10	18	14·3

(2.) *Surface Railways.*

[The speed is based on the average scheduled time of the trains between 8 and 9 a.m.]

Railway and Terminus.	Number of inward suburban trains between 8 and 9 a.m.	Average rate of speed of the inward suburban trains between 8 and 9 a.m.	Railway and terminus.	Number of inward suburban trains between 8 and 9 a.m.	Average rate of speed of the inward suburban trains between 8 and 9 a.m.
		Miles per hour.			Miles per hour.
Great Central—Marylebone ...	5	29·9	Great Northern—		
			King's Cross	16	23·3
London and North-Western—					
Euston	7	28·7	Moorgate Street	7	15·8
South-Eastern and Chatham—			London, Tilbury, and South-		
London Bridge	3	28·5	end—Fenchurch Street ...	6	21·3
Holborn	8	20·3	London and South-Western—		
			Waterloo	27	21·2
Victoria	9	19·0			
			Great Eastern—		
Charing Cross	12	18·0	Liverpool Street	38	20·3
Cannon Street	10	17·1	Fenchurch Street	14	16·0
Ludgate Hill, St. Paul's, Moorgate Street and Farringdon Street.	16	16·4	London, Brighton, and South Coast—		
			London Bridge	28	20·2
Great Western—Paddington ...	10	27·2			
			Victoria	15	18·3
Midland—					
St. Pancras	5	26·2	North London—Broad Street	28	18·1
Moorgate Street	6	15·3			

MR. EDGAR HARPER.

Number of Trains Inwards.

5. NUMBER of TRAINS in the DAY

Royal Commission on London Traffic,

Direction and terminus.	Suburban trains in each										
	mid. a.m. 12—1	a.m. 1—2	a.m. 2—3	a.m. 3—4	a.m. 4—5	a.m. 5—6	a.m. 6—7	a.m. 7—8	a.m. 8—9	a.m. 9—10	a.m. 10—11
From the West—											
Paddington	—	—	—	1	—	2	2	3	7	6	5
Bishop's Road	—	—	—	—	—	—	—	—	—	—	1
Marylebone	—	—	—	—	—	1	1	2	5	5	4
Euston	—	—	—	—	—	2	1	3	6	6	3
*Mansion House	4	—	—	—	1	7	13	18	24	24	19
*Moorgate (Met.)	11	—	—	—	—	6	18	19	24	27	24
*Piccadilly Circus (G.N.P. and B.) (*a*) ...	10	—	—	—	—	3	14	16	22	22	15
Bank (Central London)	4	—	—	—	—	5	9	18	21	29	22
	29	—	—	1	1	26	58	79	109	119	93
From the North—											
Baker Street (Metropolitan extension)	4	—	—	—	—	3	7	12	15	17	12
St. Pancras	2	—	—	1	2	—	1	3	7	7	2
King's Cross	1	—	—	1	—	1	3	7	15	13	5
Moorgate Street (G.N.)	—	—	—	—	—	3	4	6	6	8	5
" (Mid.)	—	—	—	—	—	2	1	2	6	7	4
Charing Cross (C.-X., E. and H.) (*a*) ...	19	—	—	—	—	9	24	24	24	21	24
*Farringdon Street	—	—	—	—	—	—	—	—	1	—	2
Moorgate (G.N. and C.)	—	—	—	—	—	—	12	15	20	19	18
Broad Street	1	—	—	—	—	1	3	7	18	29	17
*Bank (C. and S.L.)	—	—	—	—	—	4	12	20	23	24	17
*Piccadilly Circus (G.N.P. and B.) (*a*) ...	10	—	—	—	—	3	14	16	22	22	15
" (B. and W.) (*a*) ...	15	—	—	—	—	7	14	20	28	28	25
	52	—	—	2	2	33	95	132	185	198	146
From the East—											
Liverpool Street (G.E.)	6	2	2	4	4	10	24	36	36	33	20
Fenchurch Street (G.E.)	2	—	—	—	—	5	8	9	14	12	11
" " (L.T. and S.)	—	—	—	—	—	2	3	7	6	3	4
Broad Street	—	—	—	—	—	2	3	9	8	4	4
*Mansion House (Whitechapel and Bow)	3	—	—	—	1	4	9	17	15	13	12
	11	2	2	4	5	23	47	78	79	65	51
From the South-East—											
London Bridge (L.B. and S.C.)	3	1	—	—	1	5	7	14	24	27	14
" " (S.E. and C.)	—	—	—	—	—	—	—	1	3	2	—
Cannon Street (S.E. and C.)	—	—	—	—	1	1	1	9	10	18	14
Charing Cross (S.E. and C.)	3	—	—	—	1	4	5	7	13	13	11
St. Paul's	—	—	—	—	—	—	1	3	6	6	4
Ludgate Hill	—	1	1	—	—	—	—	3	5	1	2
Holborn Viaduct	—	—	—	2	2	3	4	2	5	6	3
Snow Hill	1	—	—	—	—	—	—	2	1	5	—
Moorgate Street (S.E. and C.)	—	—	—	—	—	—	—	4	4	2	1
*Farringdon Street (S.E. and C.) ...	—	—	—	—	—	—	—	—	1	1	1
Shoreditch and Liverpool Street (East London).	1	—	—	—	—	3	7	6	8	8	6
*Piccadilly Circus (B. and W.) (*a*) ...	15	—	—	—	—	9	14	20	28	28	25
	23	2	1	2	5	25	39	71	108	117	81
From the South-West—											
Victoria (L.B. and S.C.)	5	—	—	—	—	3	5	10	13	11	13
" (S.E. and C.)	6	—	—	1	1	2	2	5	8	8	8
Waterloo	5	—	—	1	2	6	9	10	29	26	16
*Bank (City and South London) ...	—	—	—	—	—	5	12	16	23	22	20
(Waterloo and City)	—	—	—	—	—	—	—	11	15	15	14
	16	—	—	2	3	16	28	52	88	82	71
Grand total	131	4	3	11	16	123	267	412	569	581	442

(*a*) The figures for these railways are approximate.

* Stations marked * though not physical termini are regarded as termini for the purpose of this table.

INWARDS to each TERMINUS, December, 1907.

Vol. III., Appendix 6, *Table* 32, *pages* 162-3.

MR. EDGAR HARPER.

Number of Trains Inwards.

hour (Week-day service). a.m. noon 11—12	noon p.m. 12—1	p.m. 1—2	p.m. 2—3	p.m. 3—4	p.m. 4—5	p.m. 5—6	p.m. 6—7	p.m. 7—8	p.m. 8—9	p.m. 9—10	p.m. 10—11	p.m. mid 11—12	Total.	Other trains.	Total.
3	3	2	2	3	2	1	2	5	2	4	2	3	60	68	128
—	—	2	—	—	—	—	—	—	—	—	—	—	3	—	3
—	2	1	2	3	3	2	4	4	2	3	3	2	49	13	62
2	3	2	1	2	4	1	3	1	2	1	1	2	46	58	104
18	17	18	18	17	18	19	19	21	17	17	18	17	344	—	344
20	20	20	20	20	21	21	21	20	20	19	21	20	392	—	392
15	15	15	15	20	22	22	22	18	14	14	16	20	330	—	330
20	20	21	20	21	20	29	27	19	12	10	10	8	345	—	345
78	80	81	78	86	90	95	98	88	69	68	71	72	1,569	139	1,708
13	12	12	14	12	14	17	15	16	12	9	8	12	236	—	236
1	—	3	1	1	2	2	2	3	1	2	3	1	47	34	81
3	1	1	2	—	—	1	—	1	2	5	2	3	67	52	119
4	4	5	5	5	7	7	8	8	5	3	2	4	99	—	99
3	2	3	2	2	3	5	5	2	2	1	2	1	55	—	55
24	24	24	24	24	24	24	24	24	24	24	24	24	460	—	460
1	1	1	—	1	1	1	1	1	2	—	—	—	13	—	13
17	17	17	17	17	18	20	23	18	17	17	17	12	311	—	311
10	7	9	9	9	10	12	11	15	13	8	9	7	205	—	205
15	15	15	15	15	16	20	19	17	13	12	11	6	289	—	289
15	15	15	15	20	22	22	22	18	14	14	16	20	330	—	330
17	17	17	17	17	21	28	28	23	16	14	16	21	394	—	394
123	115	122	121	123	138	159	158	151	121	109	110	111	2,506	86	2,592
16	14	15	11	14	18	19	21	20	20	16	12	15	388	37	425
9	11	10	10	11	11	12	10	9	7	7	7	5	180	—	180
2	1	2	3	3	1	3	4	2	4	3	2	2	57	3	60
4	4	4	4	4	5	9	7	6	4	4	4	3	92	—	92
12	12	12	12	12	12	12	12	12	12	12	12	12	230	—	230
43	42	43	40	44	47	55	54	49	47	42	37	37	947	40	987
10	4	11	6	9	9	11	2	13	11	9	6	5	202	49	251
1	—	1	1	1	—	—	2	—	1	—	—	—	13	—	13
5	2	2	4	7	5	7	5	4	2	4	7	2	110	2	112
7	6	6	6	6	8	8	13	14	8	7	5	9	160	27	187
1	3	3	1	3	2	3	2	3	1	2	2	—	46	—	46
2	1	—	—	1	1	1	5	1	1	—	1	—	27	—	27
3	1	—	2	—	2	1	3	2	2	2	1	3	49	19	68
—	—	—	—	1	1	1	—	2	1	—	—	—	15	—	15
3	3	3	3	2	4	4	4	5	1	4	3	2	52	—	52
1	1	1	1	1	—	—	2	1	1	—	—	1	13	—	13
6	6	6	5	6	7	8	7	7	8	5	5	5	120	—	120
17	17	17	17	17	21	28	28	28	16	14	16	21	396	—	396
56	44	50	46	54	60	72	73	80	53	47	46	48	1 203	97	1,300
7	6	8	8	7	8	12	10	10	9	8	5	9	167	47	214
6	4	6	8	4	6	7	7	9	7	8	4	5	122	21	143
10	9	17	12	18	16	19	22	19	14	10	12	11	293	65	358
15	14	15	15	14	16	19	21	18	12	12	12	11	292	—	292
14	15	15	15	13	12	12	12	12	12	12	6	—	205	—	205
52	48	61	58	56	58	69	72	68	54	50	39	36	1,079	133	1,212
352	329	357	343	363	393	450	455	436	344	316	303	304	7,804	495	7,799

MR. EDGAR HARPER.

Number of Morning Trains Inwards.

6. NUMBER of SUBURBAN TRAINS to the CENTRAL AREA on a WEEK-DAY

Royal Commission on London Traffic.

Direction and terminus.	Workmen's trains at uniform fare of 2*d.* return.							Other workmen's trains, and trains men's and partly cheap or				
	a.m. 3—4	a.m. 4—5	a.m. 5—6	a.m. 6—7	a.m. 7—8	a.m. 8—9	Total.	a.m. 3—4	a.m. 4—5	a.m. 5—6	a.m. 6—7	a.m. 7—8
From the West—												
Paddington	—	—	—	—	—	—	—	1	—	2	2	3
Euston	—	—	—	—	—	—	—	—	—	1	1	3
Marylebone	—	—	—	—	—	—	—	—	—	1	1	2
*Mansion House	—	—	—	—	—	—	—	—	1	7	13	18
*Moorgate Street (Metropolitan) ...	—	—	—	—	—	—	—	—	—	6	18	16
*Piccadilly Circus (G.N.P. and B.) (*a*)	—	—	—	—	—	—	—	—	—	3	14	12
Bank (Central London)	—	—	5	9	17	—	31	—	—	—	--	—
	—	—	5	9	17	—	31	1	1	20	49	54
From the North—												
Baker Street (Metropolitan Extension).	—	—	—	—	—	—	—	—	—	3	7	11
St. Pancras	—	—	—	—	—	—	—	—	—	—	1	2
King's Cross	—	—	—	—	—	—	—	1	—	1	2	1
Moorgate Street (G.N.)	—	—	—	—	—	—	—	—	—	3	3	.
„ (Midland)	—	—	—	—	—	—	66	—	—	2	1	2
Charing Cross (C.-X. E. and H.) (*a*)...	—	—	9	24	24	9	—	—	—	—	—	—
*Farringdon Street (Midland) ...	—	—	—	—	—	—	33	—	—	—	—	—
Moorgate (G.N. and C.)	—	—	—	12	11	—	7	—	—	—	—	—
Broad Street	—	—	—	3	4	—	—	—	—	1	—	2
*Bank (C. and S.L.)	—	—	—	—	—	—	46	—	—	4	12	20
*Piccadilly Circus (B. and W.) (*a*) ...	—	—	7	14	20	5	—	—	—	—	—	—
* „ (G.N.P. and B.) (*a*)	—	—	—	—	—	—	—	—	—	3	14	12
	—	—	16	53	59	14	142	1	—	17	40	53
From the East—												
Liverpool Street (G.E.)	—	—	10	24	4	—	38	—	—	—	—	12
Fenchurch Street (G.E.)	—	—	2	4	2	—	8	—	—	3	4	2
„ (L.T. and S.) ...	—	—	—	—	—	—	—	—	—	2	3	7
Broad Street	—	—	2	3	9	1	15	—	—	—	—	—
*Mansion House (Whitechapel and Bow).	—	—	—	—	—	—	—	—	1	4	9	16
	—	—	14	31	15	1	61	—	1	9	16	37
From the South-East—												
London Bridge (L.B. and S.C.) ...	—	—	—	—	—	—	—	—	1	5	7	13
„ (S.E. and C.)... ...	—	—	—	—	—	—	—	—	—	—	—	—
Cannon Street (S.E. and C.)	—	—	—	—	—	—	—	—	1	1	1	9
Charing Cross (S.E. and C.)	—	—	—	—	—	—	—	—	1	4	5	7
St. Paul's	—	—	—	—	—	—	—	—	—	—	1	3
Ludgate Hill and Holborn	—	1	1	3	1	—	6	2	1	2	1	4
Snow Hill	—	—	—	—	1	—	1	—	—	—	—	1
*Farringdon Street (S.E. and C.) ...	—	—	—	—	—	—	—	—	—	—	—	—
Moorgate Street (S.E. and C.) ...	—	—	—	—	—	—	—	—	—	—	—	4
Shoreditch and Liverpool Street (East London).	—	—	—	—	—	—	—	—	—	3	7	6
*Piccadilly Circus (B. and W.) (*a*) ...	—	—	9	14	20	4	47	—	—	—	—	—
	—	1	10	17	22	4	54	2	4	15	22	48
From the South-West—												
Waterloo	—	—	—	—	—	—	—	1	2	6	9	11
Victoria (L.B. and S.C.)	—	—	—	—	—	—	—	—	—	3	5	9
„ (S.E. and C.)	1	1	1	1	3	—	7	—	—	1	1	2
*Bank (C. and S.L.)	—	—	—	—	—	—	—	—	—	5	12	16
„ (Waterloo and City)	—	—	—	—	11	2	13	—	—	—	—	—
	1	1	1	1	14	2	20	1	2	15	27	38
Grand Totals	1	2	46	111	127	21	308	5	8	76	154	230

(*a*) The figures for these railways are approximate.

* Stations marked * though not physical termini, are regarded as termini for the purpose of this table.

MORNING (from the earliest workmen's train till about 10.30 a.m.), December, 1907.

Vol. III., Appendix 6, Table 34, pages 166–7.

MR. EDGAR HARPER.

Number of Morning Trains Inwards.

partly work-half-fare.		Cheap or half-fare trains.					Ordinary trains.						Grand Total.
a.m. 8—9	Total.	a.m. 5—6	a.m. 6—7	a.m. 7—8	a.m. 8—9	Total.	a.m. 6—7	a.m. 7—8	a.m. 8—9	a.m. 9—10	a.m. 10—10.30	Total.	
—	8	—	—	—	—	—	—	—	7	6	2	15	23
1	6	—	—	—	—	—	—	—	5	6	2	13	19
—	4	—	—	—	—	—	—	—	5	5	2	12	16
8	47	—	—	—	—	—	—	—	16	24	10	50	97
8	48	—	—	—	—	—	—	3	16	27	13	59	107
—	29	—	—	—	—	—	—	4	22	22	8	56	85
—	—	—	—	—	—	—	—	1	21	29	11	62	93
17	142	—	—	—	—	—	—	8	92	119	48	267	440
2	23	—	—	—	—	—	—	1	13	17	6	37	60
—	3	—	—	—	—	—	—	1	7	7	2	17	20
—	5	—	1	6	1	8	—	—	14	13	1	28	41
—	9	—	1	3	1	5	—	—	5	8	3	16	30
—	5	—	—	—	—	—	—	—	6	7	3	16	21
—	—	—	—	—	—	—	—	—	15	24	12	51	117
—	—	—	—	—	—	—	—	—	1	—	1	2	2
—	—	—	—	—	—	—	—	4	20	19	9	52	75
—	3	—	—	—	—	—	—	1	18	29	11	59	69
7	43	—	—	—	—	—	—	—	16	24	10	50	93
—	—	—	—	—	—	—	—	—	23	28	14	65	111
—	29	—	—	—	—	—	—	4	22	22	8	56	85
9	120	—	2	9	2	13	—	11	160	198	80	449	724
—	12	—	—	20	—	20	—	—	36	33	11	80	150
—	9	—	—	3	—	3	—	2	14	12	5	33	53
—	12	—	—	—	—	—	—	—	6	3	2	11	23
—	—	—	—	—	—	—	—	—	7	4	2	13	23
—	30	—	—	—	—	—	—	1	15	13	7	36	66
—	63	—	—	23	—	23	—	3	78	65	27	173	320
—	26	—	—	—	—	—	—	1	24	27	8	60	86
—	1	—	—	—	—	—	—	—	3	2	—	5	6
—	12	—	—	—	—	—	—	—	10	18	9	37	49
—	17	—	—	—	—	—	—	—	13	13	4	30	47
—	4	—	—	—	—	—	—	—	6	6	2	14	18
—	10	—	—	—	—	—	—	—	10	7	5	22	32
—	1	—	—	—	—	—	—	—	1	4	—	5	7
—	—	—	—	—	—	—	—	—	1	1	1	3	3
—	4	—	—	—	—	—	—	—	4	2	—	6	10
—	16	—	—	—	—	—	—	—	8	8	3	19	35
—	—	—	—	—	—	—	—	—	24	28	14	66	113
—	91	—	—	—	—	—	—	1	104	116	46	267	412
13	42	—	—	—	—	—	—	—	16	26	8	50	92
—	17	—	—	—	—	—	—	1	13	11	7	32	49
—	4	—	—	—	—	—	—	—	8	8	5	21	32
5	38	—	—	—	—	—	—	—	18	22	10	50	88
—	—	—	—	—	—	—	—	—	13	15	7	35	48
18	101	—	—	—	—	—	—	1	68	82	37	188	309
44	517	—	2	32	2	36	—	24	502	580	238	1,344	2,205

MR. EDGAR HARPER.

Number of Trains to Termini.

Trains to each Terminus each Week-day in December, 1907.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 33, *page* 164.

Termini.	Number of—		Total.
	Suburban Trains.	Other Trains.	
*PICCADILLY CIRCUS (Baker Street and Waterloo)	790	—	790
*PICCADILLY CIRCUS (Great Northern, Piccadilly, and Brompton)	660	—	660
*MOORGATE STREET (Metropolitan Station)	598	—	598
*BANK (City and South London)	581	—	581
*MANSION HOUSE	574	—	574
CHARING CROSS (Charing Cross, Euston, and Hampstead)	460	—	460
LIVERPOOL STREET	404	37	441
BANK (Central London)	345	—	345
MOORGATE (Great Northern and City)	311	—	311
BROAD STREET	297	—	297
WATERLOO	293	65	358
VICTORIA	289	68	357
FENCHURCH STREET...	237	3	240
BAKER STREET (Metropolitan Extension)	236	—	236
LONDON BRIDGE	215	49	264
BANK (Waterloo and City)	205	—	205
CHARING CROSS	160	27	187
ST. PAUL'S, LUDGATE HILL, SNOW HILL, and *FARRINGDON STREET ...	114	—	114
CANNON STREET	110	2	112
SHOREDITCH	104	—	104
KING'S CROSS	67	52	119
PADDINGTON and BISHOP'S ROAD	63	68	131
HOLBORN VIADUCT	49	19	68
MARYLEBONE	49	13	62
ST. PANCRAS	47	34	81
EUSTON	46	58	104
TOTAL	7,304	495	7,799

* Stations marked * though not physical termini are regarded as termini for the purpose of this table.

Number of Morning Trains Inwards.

Number of Trains to the Central Area in the hours between the First Workmen's Train and 10.30 a.m. on an ordinary Week-day in December, 1907.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 35, *page* 170.

Directions from which trains run.	Number of Trains.					
	Workmen's (at 2*d.* fare).	Other workmen's trains.	Cheap or half-fare.	Total Cheap.	Ordinary.	Total.
From the West	31	142	—	173	267	440
„ „ North	142	120	13	275	449	724
„ „ East	61	63	23	147	173	320
„ „ South-East	54	91	—	145	267	412
„ „ South-West	20	101	—	121	188	309
Total	308	517	36	861	1,344	2,205

Length in Route Miles of Railways (for the Conveyance of Passengers) in Greater London in December, 1907.

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 28, pages 154–5.

Railways.	Length (route miles).																						
	Western Section.			Northern Section.			Eastern Section.			Total North of the River.			South-Eastern Section.			South-Western Section.			Total South of the River.			Total.		
	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Greater London.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
TRUNK LINES.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.
South-Eastern and Chatham.	1·0	—	1·0	1·0	—	1·0	—	—	—	2·0	—	2·0	49·6	57·3	106·9	12·4	3·4	15·8	62·0	60·7	122·7	64·0	60·7	124·7
Great Eastern	—	—	—	·6	25·6	26·2	15·6	44·3	59·9	16·2	69·9	86·1	—	—	—	—	—	—	—	—	—	16·2	69·9	86·1
London and South-Western.	2·0	32·7	34·7	—	—	—	—	—	—	2·0	32·7	34·7	—	—	—	11·9	29·1	41·0	11·9	29·1	41·0	13·9	61·8	75·7
London, Brighton and South Coast.	·8	—	·8	—	—	—	—	—	—	·8	—	·8	12·1	21·8	33·9	16·6	20·4	37·0	28·7	42·2	70·9	29·5	42·2	71·7
Great Western	4·8	32·4	37·2	—	—	—	—	—	—	4·8	32·4	37·2	—	—	—	—	—	—	—	—	—	4·8	32·4	37·2
Great Northern	—	·2	·2	4·4	28·1	32·5	—	—	—	4·4	28·3	32·7	—	—	—	—	—	—	—	—	—	4·4	28·3	32·7
London and North-Western.	2·7	14·4	17·1	7·1	—	7·1	—	—	—	9·8	14·4	24·2	—	—	—	—	—	—	—	—	—	9·8	14·4	24·2
Midland	—	4·5	4·5	5·5	10·3	15·8	—	—	—	5·5	14·8	20·3	—	—	—	—	—	—	—	—	—	5·5	14·8	20·3
Great Central	—	14·9	14·9	2·7	—	2·7	—	—	—	2·7	14·9	17·6	—	—	—	—	—	—	—	—	—	2·7	14·9	17·6
London, Tilbury and Southend.	—	—	—	—	—	—	·6	15·7	16·3	·6	15·7	16·3	—	—	—	—	—	—	—	—	—	·6	15·7	16·3
Total	11·3	99·1	110·4	21·3	64·0	85·3	16·2	60·0	76·2	48·8	223·1	271·9	61·7	79·1	140·8	40·9	52·9	93·8	102·6	132·0	234·6	151·4	355·1	506·5
LOCAL LINES.																								
Metropolitan	3·6	12·4	16·0	9·1	—	9·1	—	—	—	12·7	12·4	25·1	—	—	—	—	—	—	—	—	—	12·7	12·4	25·1
Metropolitan District...	9·3	14·7	24·0	·7	—	·7	—	—	—	10·0	14·7	24·7	—	—	—	—	—	—	—	—	—	10·0	14·7	24·7
Forth London	—	—	—	5·1	—	5·1	5·5	—	5·5	10·6	—	10·6	—	—	—	—	—	—	—	—	—	10·6	—	10·6
Total	12·9	27·1	40·0	14·9	—	14·9	5·5	—	5·5	33·3	27·1	60·4	—	—	—	—	—	—	—	—	—	33·3	27·1	60·4
LOCAL JOINT LINES.																								
Croydon and Oxted ...	—	—	—	—	—	—	—	—	—	—	—	—	—	7·3	7·3	—	—	—	—	7·3	7·3	—	7·3	7·3
East London	—	—	—	—	—	—	1·8	—	1·8	1·8	—	1·8	5·0	—	5·0	—	—	—	5·0	—	5·0	6·8	—	6·8
Tottenham and Forest Gate.	—	—	—	—	·7	·7	—	5·3	5·3	—	6·0	6·0	—	—	—	—	—	—	—	—	—	—	6·0	6·0
Tooting, Merton and Wimbledon.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	·7	4·9	5·6	·7	4·9	5·6	·7	4·9	5·6

Mr. Edgar Harper.

Length of Railways in Greater London.

Route Mileage of Railways—*continued.*

Railways.	Length (route miles).																						
	Western Section.			Northern Section.			Eastern Section.			Total North of the River.			South-Eastern Section.			South-Western Section.			Total North of the River.			Total.		
	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Greater London.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
LOCAL JOINT LINES —*continued.*	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.
METROPOLITAN AND GREAT CENTRAL JOINT.	—	5·1	5·1	—	—	—	—	—	—	—	5·1	5·1	—	—	—	—	—	—	—	—	—	—	5·1	5·1
NORTH AND SOUTH-WESTERN JUNCTION.	·5	4·6	5·1	—	—	—	—	—	—	·5	4·6	5·1	—	—	—	—	—	—	—	—	—	·5	4·6	5·1
WEST LONDON EXTENSION	1·8	—	1·8	—	—	—	—	—	—	1·8	—	1·8	—	—	—	3·0	—	3·0	3·0	—	3·0	4·8	—	4·8
GREAT CENTRAL AND GREAT WESTERN JOINT.	—	4·5	4·5	—	—	—	—	—	—	—	4·5	4·5	—	—	—	—	—	—	—	—	—	—	4·5	4·5
TOTTENHAM AND HAMPSTEAD.	—	—	—	1·9	2·6	4·5	—	—	—	1·9	2·6	4·5	—	—	—	—	—	—	—	—	—	1·9	2·6	4·5
HAMMERSMITH AND CITY...	3·0	—	3·0	—	—	—	—	—	—	3·0	—	3·0	—	—	—	—	—	—	—	—	—	3·0	—	3·0
WEST LONDON	2·3	—	2·3	—	—	—	—	—	—	2·3	—	2·3	—	—	—	—	—	—	—	—	—	2·3	—	2·3
WHITECHAPEL AND BOW...	—	—	—	—	—	—	2·2	—	2·2	2·2	—	2·2	—	—	—	—	—	—	—	—	—	2·2	—	2·2
METROPOLITAN AND METROPOLITAN DISTRICT.	—	—	—	1·2	—	1·2	·8	—	·8	2·0	—	2·0	—	—	—	—	—	—	—	—	—	2·0	—	2·0
EPSOM AND LEATHERHEAD	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·1	1·1	—	1·1	1·1	—	1·1	1·1
Total	7·6	14·2	21·8	3·1	3·3	6·4	4·8	5·3	10·1	15·5	22·8	38·3	5·0	7·3	12·3	3·7	6·0	9·7	8·7	13·3	22·0	24·2	36·1	60·3
TUBULAR LINES.																								
GREAT NORTHERN, PICCADILLY AND BROMPTON.	5·3	—	5·3	4·0	—	4·0	—	—	—	9·3	—	9·3	—	—	—	—	—	—	—	—	—	9·3	—	9·3
CHARING CROSS, EUSTON AND HAMPSTEAD.	·5	—	0·5	6·6	·7	7·3	—	—	—	7·1	·7	7·8	—	—	—	—	—	—	—	—	—	7·1	·7	7·8
CITY AND SOUTH LONDON	—	—	—	3·6	—	3·6	—	—	—	3·6	—	3·6	—	—	—	3·9	—	3·9	3·9	—	3·9	7·5	—	7·5
CENTRAL LONDON	3·8	—	3·8	2·0	—	2·0	—	—	—	5·8	—	5·8	—	—	—	—	—	—	—	—	—	5·8	—	5·8
BAKER STREET AND WATERLOO.	1·4	—	1·4	1·7	—	1·7	—	—	—	3·1	—	3·1	—	—	—	1·2	—	1·2	1·2	—	1·2	4·3	—	4·3
GREAT NORTHERN AND CITY.	—	—	—	3·4	—	3·4	—	—	—	3·4	—	3·4	—	—	—	—	—	—	—	—	—	3·4	—	3·4
WATERLOO AND CITY ...	—	—	—	·6	—	·6	—	—	—	·6	—	·6	—	—	—	·9	—	·9	·9	—	·9	1·5	—	1·5
Total	11·0	—	11·0	21·9	·7	22·6	—	—	—	32·9	·7	33·6	—	—	—	6·0	—	6·0	6·0	—	6·0	38·9	·7	39·6
GRAND TOTAL... ...	42·8	140·4	183·2	61·2	68·0	129·2	26·5	65·3	91·8	130·5	273·7	404·2	66·7	86·4	153·1	50·6	58·9	109·5	117·3	145·3	262·6	247·8	419·0	666·8

MR. EDGAR HARPER.

Length of Railways in Greater London.

Length of Railways in Route Miles in Greater London—according to Sections—in December, 1907.

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 29, paye 156.

Section.	Length of Railway.			Length per Square Mile.			Population per Mile of Line. (Based on the estimated population in December, 1907.)		
	In London.	In Extra-London.	Whole Area.	In London.	In Extra-London.	Whole Area.	In London.	In Extra-London.	Whole Area.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.			
Western	42·8	140·4	183·2	2·54	·88	1·04	20,276	3,735	7,600
Northern	61·2	68·0	129·2	3·08	·53	·87	18,570	7,474	12,780
Eastern	26·5	65·3	91·8	2·08	·69	·85	31,754	13,626	18,859
Total North ...	130·5	273·7	404·2	2·64	·71	·93	21,807	7,024	11,797
South-eastern ...	66·7	86·4	153·1	1·62	·84	1·06	13,712	4,065	8,268
South-western ...	50·6	58·9	109·5	1·96	·66	·95	19,808	4,810	11,741
Total South ...	117·3	145·3	262·6	1·76	·75	1·01	16,342	4,367	9,716
Grand Total	247·8	419·0	666·8	2·13	·73	·96	19,212	6,103	10,377

Number of Passenger Railway Stations in Greater London in December, 1907.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 30, *pages* 158–160.

Railways.	Number of Stations.																						
	Western Section.			Northern Section.			Eastern Section.			Total North of the River.			South-Eastern Section.			South-Western Section.			Total South of the River.			Total.		
	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Greater London.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
TRUNK LINES.																								
South-Eastern and Chatham	3	—	3	5	—	5	—	—	—	8	—	8	44	33	77	10	4	14	54	37	91	62	37	99
Great Eastern	—	—	—	2	22	24	25	39	64	27	61	88	—	—	—	—	—	—	—	—	—	27	61	88
London, Brighton and South Coast ...	1	—	1	—	—	—	—	—	—	1	—	1	13	11	24	13	17	30	26	28	54	27	28	55
London and South Western	—	20	20	—	—	—	—	—	—	—	20	20	—	—	—	12	18	30	12	18	30	12	38	50
Great Northern	—	—	—	4	25	29	—	—	—	4	25	29	—	—	—	—	—	—	—	—	—	4	25	29
Great Western	4	15	19	—	—	—	—	—	—	4	15	19	—	—	—	—	—	—	—	—	—	4	15	19
London and North-Western	3	7	10	9	—	9	—	—	—	12	7	19	—	—	—	—	—	—	—	—	—	12	7	19
Midland	—	—	—	6	6	12	—	—	—	6	6	12	—	—	—	—	—	—	—	—	—	6	6	12
London, Tilbury and Southend ...	—	—	—	—	—	—	1	7	8	1	7	8	—	—	—	—	—	—	—	—	—	1	7	8
Great Central	—	3	3	1	—	1	—	—	—	1	3	4	—	—	—	—	—	—	—	—	—	1	3	4
Total	11	45	56	27	53	80	26	46	72	64	144	208	57	44	101	35	39	74	92	83	175	156	227	383
LOCAL LINES.																								
Metropolitan District	17	17	34	2	—	2	—	—	—	19	17	36	—	—	—	—	—	—	—	—	—	19	17	36
Metropolitan...	6	6	12	15	—	15	—	—	—	21	6	27	—	—	—	—	—	—	—	—	—	21	6	27
North London	—	—	—	11	—	11	7	—	7	18	—	18	—	—	—	—	—	—	—	—	—	18	—	18
Total	23	23	46	28	—	28	7	—	7	58	23	81	—	—	—	—	—	—	—	—	—	58	23	81
LOCAL JOINT LINES.																								
Tottenham and Hampstead	—	—	—	6	3	9	—	—	—	6	3	9	—	—	—	—	—	—	—	—	—	6	3	9
East London	—	—	—	—	—	—	4	—	4	4	—	4	2	—	2	—	—	—	2	—	2	6	—	6
Hammersmith and City	5	—	5	—	—	—	—	—	—	5	—	5	—	—	—	—	—	—	—	—	—	5	—	5

Railway Stations—*continued.*

Railways.	Number of Stations.																						
	Western Section.			Northern Section.			Eastern Section.			Total North of the River.			South-Eastern Section.			South-Western Section.			Total South of the River.			Total.		
	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Total.	London.	Extra London.	Greater London.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
LOCAL JOINT LINES—*continued.*																								
Metropolitan and Metropolitan District.	—	—	—	—	—	—	5	—	5	5	—	5	—	—	—	—	—	—	—	—	—	5	—	5
Tottenham and Forest Gate	—	—	—	—	—	—	—	5	5	—	5	5	—	—	—	—	—	—	—	—	—	—	5	5
Tooting, Merton and Wimbledon ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	5	—	5	5	—	5	5
Croydon and Oxted	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	—	—	—	4	4	—	4	4
Whitechapel and Bow	—	—	—	—	—	—	4	—	4	4	—	4	—	—	—	—	—	—	—	—	—	4	—	4
North- and South-Western Junction	—	3	3	—	—	—	—	—	—	—	3	3	—	—	—	—	—	—	—	—	—	—	3	3
West London Extension	2	—	2	—	—	—	—	—	—	2	—	2	—	—	—	1	—	1	1	—	1	3	—	3
Metropolitan and Great Central Joint.	—	3	3	—	—	—	—	—	—	—	3	3	—	—	—	—	—	—	—	—	—	—	3	3
West London	2	—	2	—	—	—	—	—	—	2	—	2	—	—	—	—	—	—	—	—	—	2	—	2
Great Central and Great Western Joint.	—	1	1	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	1	1
Total	9	7	16	6	3	9	13	5	18	28	15	43	2	4	6	1	5	6	3	9	12	31	24	55
TUBULAR LINES.																								
Great Northern, Piccadilly and Brompton.	14	—	14	8	—	8	—	—	—	22	—	22	—	—	—	—	—	—	—	—	—	22	—	22
Charing Cross, Euston and Hampstead	3	—	3	12	1	13	—	—	—	15	1	16	—	—	—	—	—	—	—	—	—	15	1	16
City and South London	—	—	—	7	—	7	—	—	—	7	—	7	—	—	—	8	—	8	8	—	8	15	—	15
Central London	9	—	9	4	—	4	—	—	—	13	—	13	—	—	—	—	—	—	—	—	—	13	—	13
Baker Street and Waterloo	4	—	4	4	—	4	—	—	—	8	—	8	—	—	—	3	—	3	3	—	3	11	—	11
Great Northern and City	—	—	—	6	—	6	—	—	—	6	—	6	—	—	—	—	—	—	—	—	—	6	—	6
Waterloo and City	—	—	—	1	—	1	—	—	—	1	—	1	—	—	—	1	—	1	1	—	1	2	—	2
Total	30	—	30	42	1	43	—	—	—	72	1	73	—	—	—	12	—	12	12	—	12	84	1	85
Grand Total	73	75	148	103	57	160	46	51	97	222	183	405	59	48	107	48	44	92	107	92	199	329	275	604

MR. EDGAR HARPER.

Railway Stations.

Number of Railway Stations in Greater London in December, 1907—according to Sections.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 31, *page* 160.

Section.	Number of Stations.			Number of Stations per Square Mile.			Number of Inhabitants per Station. (Based on the estimated population in December, 1907.)		
	In London.	In Extra-London.	Total.	In London.	In Extra-London	Total.	In London.	In Extra-London.	Total
Western	73	75	148	4·32	·47	·84	11,888	6,993	9,407
Northern	103	57	160	5·19	·44	1·07	11,034	8,916	10,279
Eastern	46	51	97	3·62	.54	·90	18,293	17,447	17,848
Total north ...	222	183	405	4·49	·48	·93	12,819	10,505	11,773
South-eastern ...	59	48	107	1·44	·46	·74	15,501	7,316	11,830
South-western ...	48	44	92	1·86	·49	·80	20,881	6,439	13,974
Total south ...	107	92	199	1·60	·48	·77	17,915	6,897	12,821
Grand Total	329	275	604	2·83	·48	·87	14,476	9,298	12,119

Speed of Horse and Motor Omnibuses.

Comparative Speed of Horse and Motor Omnibuses.

Table showing time taken by horse omnibuses and motor omnibuses respectively on certain journeys made in May, 1908, on routes or parts of routes used by them in common, and the speed per hour.

Route or Section of Route.	Approximate Distance.	Horse Omnibuses.		Motor Omnibuses.	
		Time for Journey.	Speed per Hour.	Time for Journey.	Speed per Hour.
	Miles.	Minutes.	Miles.	Minutes.	Miles.
A.—ROUTES TO OR THROUGH CENTRAL AREA.					
1. Liverpool Street to Wormwood Scrubs ...	7·2	70	6·2	56	7·7
Wormwood Scrubs to Liverpool Street ...	7·3	74	5·9	61½	7·1
2. Bank to Shepherd's Bush	5·7	61	5·6	57½	6·0
Shepherd's Bush to Bank	5·7	62	5·5	45	7·6
3. Oxford Circus to Kilburn	3·5	37	5·7	27½	7·7
Kilburn to Oxford Circus	3·5	34	6·2	26½	8·1
4. Bank to Putney	7·0	67	6·3	55	7·7
Putney to Bank	7·0	75	5·6	61	6·8
5. Bank to Hammersmith	6·5	61	6·4	49	8·0
Hammersmith to Bank	6·4	61	6·3	56½	6·8
Average Speed	... ...	...	6·0	...	7·3
B.—OUTLYING ROUTES.					
6. Clapham (Plough) to Putney...	3·9	37	6·3	27	8·6
Putney to Clapham (Plough)...	3·9	40	5·8	26	8·9
7. Shepherd's Bush to Putney	3·2	31½	6·1	20	9·6
Putney to Shepherd's Bush	3·2	29¾	6·4	20½	9·4
Average Speed (outlying routes) ...	... ...	...	6·1	...	9·1
Average Speed for all the above journeys ...	... ...	...	6·0	...	7·5

OMNIBUS ROUTES IN LONDON.

MR. EDGAR HARPER.

Omnibus Routes.

7. List of horse and motor omnibus routes in London in December, 1907, classified under the heads of (1) Radiating routes, or routes to points in the central district; (2) Through routes, or routes passing through the central district; (3) Connecting routes, mainly between railway termini; and (4) Outlying routes.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 11, *pages* 134–142.

I.—*Horse Omnibus Routes.*

Route.	*Via* (Principal streets traversed only.)	Length of route.	Fare for whole distance.
Radiating routes—		Miles.	*d.*
1. VICTORIA and ... ... Paddington	Park Lane, Edgware Road, Praed Street, Bishop's Road.	3·1	3
2. „ ... ... Willesden ... ... ("Spotted Dog")	Park Lane, Edgware Road. Warwick Road, Shirland Road, Salisbury Road, Willesden Lane.	5·9	5
3. „ ... ... Swiss Cottage	Victoria Street, Charing Cross, Hampstead Road, Chalk Farm Road, Adelaide Road.	5·8	4
4. „ ... ... Archway Tavern ...	Victoria Street, Hampstead Road, Kentish Town Road.	5·6	4
5. „ ... ... Crouch End	Victoria Street, Hampstead Road, Kentish Town Road, Duncombe Road, Crouch Hill.	6·6	5½
6. „ ... ... Tollington Park ...	Grosvenor Place. Bond Street, Oxford Circus, Euston Road, Great Portland Street, Upper Street, Islington, Holloway Road, Hornsey Road.	7·5	5
7. „ ... ... Finsbury Park ...	Victoria Street, Hampstead Road, Camden Road, Seven Sisters Road.	6·7	4
8. „ ... ... Stoke Newington ... ("Weavers' Arms")	Victoria Street, Chancery Lane, Rosebery Avenue, Essex Road, Albion Road, Church Street.	6·4	5
9. „ ... ...Clapham	Buckingham Palace Road, Chelsea Bridge, Queen's Road, Wandsworth Road, North Street	3·1	2
10. CHARING CROSS and ... Westbourne Grove ...	Regent Street, Oxford Street, Praed Street, Westbourne Grove.	3·3	3
11. „ „ ... Kensal Rise	Regent Street, Oxford Street, Praed Street, Harrow Road, Station Road.	5·4	4
12. „ „ ... Harlesden	Regent Street, Oxford Street, Praed Street, Porchester Road, Harrow Road.	6·5	5
13. „ „ ... Kilburn ... ... ("Lord Palmerston")	Regent Street, Oxford Street. Edgware Road, High Road, Kilburn.	4·6	4
14. „ „ ... Muswell Hill	Charing Cross Road, Hampstead Road, Kentish Town Road, Archway Road.	6·3	4½
15. OXFORD CIRCUS and ... Finchley	Oxford Street, Orchard Street, Baker Street, Park Road, Finchley Road.	3·8	6
16. „ „ ... Old Ford	Oxford Street, Holborn, Threadneedle Street, Bethnal Green Road, Roman Road.	5·8	4
17. „ „ ... Brixton... ... ... ("White Horse")	Regent Street, Parliament Street, Kennington Road, Brixton Road.	4·6	3
17A. TOTTENHAM COURT ROAD and Mile End ...	Theobald's Road, Old Street, Commercial Street, Mile End Road.	4·1	2
18. BANK and ... ... South Hackney ... ("Alexandra Hotel")	Bishopsgate Street, Shoreditch, Bethnal Green Road, Cambridge Road, Mare Street, Victoria Park Road.	2·9	2
19. „ ... ... South Hackney ... ("Queen's Hotel")	Bishopsgate Street, Shoreditch, Bethnal Green Road, Mare Street, Victoria Park Road.	3·3	2
20. „ ... ... Bow Bridge	Leadenhall Street, Aldgate, Whitechapel Road, Bow Road.	3·4	2
21. LIVERPOOL STREET and Westminster ... ... ("Monster")	Queen Victoria Street, Strand, Great Smith Street, Lupus Street.	4·4	3
22. „ „ Putney ... ... ("Eight Bells")	Queen Victoria Street, Strand, Piccadilly, Fulham Road.	7·8	5
23. „ „ Putney Station ...	Queen Victoria Street, Strand, Piccadilly. Putney Bridge.	8·1	5
24. „ „ Putney ... ... (Barnes Common)	Queen Victoria Street, Strand, Piccadilly, Fulham Road, Putney Bridge, Lower Richmond Road.	8·4	6
25. „ „ Turnham Green ...	Queen Victoria Street, Strand, Piccadilly, Kensington Road, King Street West.	8·7	6
26. „ „ Shepherd's Bush ... ("Victoria Tavern")	Cheapside, Oxford Street, Uxbridge Road ...	7·3	5
27. „ „ Bayswater ... ... ("Earl Percy")	Cheapside, Oxford Street, Praed Street, Archer Street, Ladbroke Grove.	6·5	4
28. „ „ Wormwood Scrubs ...	Cheapside, Oxford Street, Praed Street, Archer Street, Ladbroke Grove, St. Mark's Road.	7·2	5
29. „ „ Kilburn ... ... ("Lord Palmerston")	Cheapside, Oxford Street, Edgware Road, High Road, Kilburn.	6·4	5
30. „ „ Peckham ... ... ("Plough")	Minories, Tower Bridge, St. James Road, Peckham Park Road, Peckham Rye, Barry Road.	5·4	4
31. „ „ Camberwell	Minories, Tower Bridge, Abbey Street, Upper Grange Road, Albany Road.	3·5	2
32. „ „ Streatham	Gracechurch Street, London Bridge, Newington Butts and Brixton Road.	7·0	5
33. SHOREDITCH and ... Fulham ... ... ("Wandsworth Bridge Tavern")	Bishopsgate Street, Strand, Victoria Street, King's Road, Wandsworth Bridge Road.	7·7	5
34. „ ... Fulham ... ... ("Salisbury")	Bishopsgate Street, Queen Victoria Street, Strand, Victoria Street, King's Road, Harwood Road, Dawes Road.	7·6	5
35. „ ... West Kensington ... ("Cedars")	Bishopsgate Street, Queen Victoria Street, Strand, Piccadilly, Brompton Road, North End Road.	7·3	5
36. „ ... Camberwell Green ...	Bishopsgate Street, London Bridge, Walworth Road.	4·1	2½

I.—*Horse Omnibus Routes*—continued.

MR. EDGAR HARPER.

Omnibus Routes.

Route.	*Via* (Principal streets traversed only.)	Length of route.	Fare for whole distance.
Connecting routes—		Miles.	*d.*
73. EUSTON ... ... Waterloo	Woburn Place, Chancery Lane, Waterloo Bridge...	2·6	3
74. ST. PANCRAS ... ... Waterloo	Judd Street, Southampton Row, St. Martin's Lane, Waterloo Bridge.	2·8	3
75. KING'S CROSS ... ... Waterloo	Judd Street, Southampton Row, St. Martin's Lane, Waterloo Bridge.	3·0	3
76. LIVERPOOL STREET ... Waterloo	Queen Victoria Street, Stamford Street	2·0	2
77. WATERLOO ROAD ... Strand	Waterloo Bridge	·7	½
78. BLACKFRIARS ROAD ... Farringdon Street ...	Blackfriars Bridge	·8	½
Outlying routes—			
79. HAMMERSMITH ... Uxbridge Road ...	Paddenswick Road, Askew Road	1·6	1
80. ,, ... Clapham Junction ...	Fulham Palace Road, Dawes Road, York Road, Falcon Road, Wandsworth Bridge.	4·6	3
81. ,, ... Wandsworth ... ... (Southfields Station)	Fulham Palace Road, Dawes Road, Wandsworth Bridge, York Road, Buckhold Road, Merton Road, Replingham Road.	5·0	3½
82. SHEPHERD'S BUSH ... Walham Green ...	Holland Road, North End Road	2·3	2
83. ,, ,, ... Putney ... ... (Station)	Richmond Road, Fulham Palace Road, Putney Bridge.	2·9	3
84. NOTTING HILL ... Holloway	Queen's Road, Clifton Road, St. John's Wood Road, Albert Road, Camden Road.	5·3	5
85. KILBURN ... ... Harlesden	Christchurch Avenue, Willesden Lane	4·1	3
86. BRONDESBURY ... Putney	Kilburn High Road, Canterbury Road, Malvern Road, Pembridge Villas, Church Street, Earl's Court Road, Fulham Road, Putney Bridge.	6·6	6
87. FINCHLEY ROAD ("North Star") ... Fulham	Belsize Road, Malvern Road, Pembridge Villas, Church Street, Earl's Court Road.	5·9	6
88. WEST HAMPSTEAD ... Fulham...	West End Lane, Malvern Road, Pembridge Villas, Church Street, Earl's Court Road	5·7	5
89. FINSBURY PARK (Station) ... Clapton... ... ... ("White Hart")	Finsbury Park Road, Brownswood Road, Manor Road, Northwold Road, Lower Clapton Road.	2·9	3
90. POPLAR ... ... Deptford	Blackwall Tunnel, Trafalgar Road, Creek Road...	3·5	2
91. ,, ... Canning Town ... ("Abbey Arms")	East India Dock Road and Barking Road ...	·9	1
92. MILLWALL ... ... West India Dock ... (Station)	Westferry Road, Bridge Road	1·1	1
93. CADETS' ACADEMY ... Woolwich ... ... (Arsenal Station)	Herbert Road, Burrage Road	1·5	2 down 3 up
94. WOOLWICH ... ... Eltham .. .. (Free Ferry)	Powis Street, New Road, Woolwich Common Road, Westmount Road.	3·7	4
95. WOOLWICH ... ... Charlton ... ... (Arsenal Station) ("Bugle Horn")	Wellington Street, Artillery Place, Hill Street ...	1·7	3
96. BEXLEY HEATH ... Woolwich ... ... (Arsenal Station)	Wickham Lane, Plumstead Road	3·0	3
97. CATFORD .. ... Penge	Rushey Green, Catford Hill, Sydenham Road, Cator Road, Kent House Road, Green Lane.	3·3	3
98. BECKENHAM ... ... Catford ... ... (Station)	Beckenham Road, Lawrie Park Road, Kirkdale, Dartmouth Road, Stanstead Road.	5·5	5
99. BLACKHEATH ... ... Charlton ... ... (Station)	Blackheath, Vanbrugh Park, Charlton Road ...	1·3	3
100. ,, ,, ... Shooter's Hill	Shooter's Hill Road	1·9	3
101. ,, ,, ... Grove Park	Lee Road, Burnt Ash Hill, College Road	2·9	3
102. NEW CROSS ... ... Bell Green	Lewisham High Road, Brockley Road, Stanstead Road, Perry Vale, Sydenham Road.	3·7	3
103. GIPSY HILL ... ... Brixton... ... ... (Station)	Croxted Road, Norwood Road, Water Lane, Effra Road.	3·0	3
104. DULWICH ... ... Old Kent Road ... ("Lord Nelson")	East Dulwich Road, Rye Lane, Hill Street, Trafalgar Road.	3·5	3
105. CROYDON ... ... Brixton...	Croydon High Street, Streatham Hill, Brixton Hill.	7·3	5
106. CAMBERWELL GREEN Clapham ... ... ("Plough")	Coldharbour Lane, Acre Lane, Clapham Park Road.	2·4	2
107. BRIXTON ... ... Norwood ... ... (Station) ("Thurlow Arms")	Railton Road, Norwood Road	2·0	2
108. BRIXTON HILL ... Balham... ... ... (Station)	New Park Road, Emmanuel Road	1·9	1
109. CLAPHAM JUNCTION Tooting Broadway ...	Northcote Road, Broomwood Road, Bellevue Road, Trinity Road.	2·9	2
110. ,, ,, Turnham Green ...	Battersea Park Road, Albert Bridge, Sydney Street, Harrington Road, Gloucester Road, Church Street, Uxbridge Road, Goldhawk Road.	7·4	5
111. ,, ,, Streatham ... ... ("White Lion")	Northcote Road, Ravenslea Road, Bedford Hill, High Road, Streatham.	3·7	3
112. CLAPHAM ... ... Putney ... ... ("Plough") ("Northumberland Arms")	Clapham Common North Side, St. John's Road, East Hill, Upper Richmond Road.	4·6	4

MR. EDGAR HARPER.

Omnibus Routes.

I.—*Horse Omnibus Routes*—continued

	Route.	*Via* (Principal Streets traversed only.)	Length of route	Fare for whole distance.
	Outlying routes—*cont.*		Miles.	*d.*
113.	PUTNEY (Station) ... ... Roehampton	Putney Hill, Putney Heath North...	1·5	3
114.	„ „ ... ... Wimbledon (Station)	Putney Hill, Wimbledon Park Side	3·4	4
115.	„ „ ... ... Richmond	Upper Richmond Road	3·9	4

II.—*Motor Omnibus Routes.*

	Radiating Routes—			
116.	VICTORIA and ... Kensal Rise (Station)	Grosvenor Place, Edgware Road, Shirland Road, Kilburn Lane.	5·2	5
117.	„ ... Willesden ... ... ("White Hart")	Grosvenor Place, Edgware Road, Shirland Road, Willesden Lane.	6·9	5
118.	„ ... Cricklewood ... ... ("Crown")	Grosvenor Place, Edgware Road	5·5	5
119.	„ ... Hampstead Heath ...	Victoria Street, Charing Cross Road, Hampstead Road, Haverstock Hill.	5·8	4
120.	„ ... Gospel Oak ... ... ("Mansfield Arms")	Victoria Street, Charing Cross Road, Hampstead Road, Malden Road.	5·5	4
121.	CHARING CROSS ... Hammersmith ...	Piccadilly, Knightsbridge, Hammersmith Road ...	4·6	4
122.	PICCADILLY CIRCUS Barnes ... ... ("Red Lion")	Knightsbridge, Hammersmith Road, Hammersmith Bridge, Castlenau.	5·5	4
123.	OXFORD CIRCUS and... Leyton	Holborn, Threadneedle Street, Bethnal Green Road. Mare Street, Lea Bridge Road.	8·9	5
124.	„ ... Upton Park	Holborn, Cornhill, Commercial Road, Barking Road, Green Street.	9·1	5
125.	„ ... Peckham	Regent Street, Whitehall, Westminster Bridge Road, Walworth Road, Peckham Road.	5·3	3
126.	„ ... Sidcup	Regent Street, Westminster Bridge Road, Walworth Road. Queen's Road, Lewisham High Road, Lee High Road, Eltham Road, Foots Cray Road.	14·2	9
127.	LIVERPOOL STREET and Wormwood Scrubs ...	Cheapside, Oxford Street, Praed Street, Archer Street, Ladbroke Grove, St. Mark's Road.	7·2	5
128.	„ Kensal Rise	Queen Victoria Street, Regent Street, Edgware Road, Shirland Road, Kilburn Lane.	7·4	5
129.	„ Barnes	Queen Victoria Street, Whitehall, King's Road, Dawes Road, Hammersmith Bridge, High Street, Barnes.	10·9	7
130.	SHOREDITCH and ... Hammersmith ...	Bishopsgate Street, Queen Victoria Street, Regent Street, Bayswater Road, Shepherd's Bush Road.	8·3	6
131	„ ... Putney	Bishopsgate Street, Strand, Brompton Road, Walham Green, Putney Bridge, High Street.	3·9	6
132.	„ ... Barnes Common ...	Bishopsgate Street, Strand, Brompton Road, Walham Green, Putney Bridge, Lower Richmond Road.	9·1	6
133.	WATERLOO ... ... Chalk Farm	Waterloo Bridge, Kingsway, Seymour Street, High Street Camden Town.	3·6	3
	Through routes—			
134.	WEST KENSINGTON ... Hornsey rise	Greyhound Road, Lillie Road, Brompton Road, Regent Street, Great Portland Street, Caledonian Road, Holloway Road.	9·8	6
135.	HAMMERSMITH ... Stoke Newington ...	Shepherd's Bush Road, Bayswater Road, Hart Street, Essex Road, Albion Road, High Street, Stoke Newington.	9·8	6½
136.	CRICKLEWOOD ... Elephant and Castle ...	Edgware Road, Marylebone Road, Tottenham Court Road, Charing Cross Road, Waterloo Bridge.	7·8	5
137.	„ ... Herne Hill ... ... ("Half Moon")	Edgware Road, Regent Street, Great Smith Street, Vauxhall Bridge, South Lambeth Road, Stockwell Road, Milkwood Road.	10·4	6
138.	SWISS COTTAGE ... East Ham	Finchley Road, Baker Street, Oxford Street, Holborn, Cornhill, Commercial Road, Barking Road.	12·0	7
139.	CHILD'S HILL ... Ebury Bridge	Finchley Road, Baker Street. Park Lane, Grosvenor Place, Wilton Road, Warwick Street.	6·6	5
140.	HIGHBURY ... ... Clapham Junction ... ("Barn")	Upper Street, Rosebery Avenue, Charing Cross Road Shaftesbury Avenue, Piccadilly, Sloane street, King's Road, Battersea Bridge, Battersea Park Road, Falcon Road.	8·8	7
141.	LEYTON ... ... Elephant and Castle ...	Lea Bridge Road, Lower Clapton Road, Mare Street, Bethnal Green Road, Bishopsgate Street, London Bridge.	8·9	5
142.	PUTNEY ... ... Bow Bridge	High Street, Fulham Road, Brompton Road, Haymarket, Strand, Cornhill, Whitechapel Road, Bow Road.	11·1	7
143.	BARNES ... ... Canning Town ...	Warple Way, High Street Barnes, Castlenau, Hammersmith Bridge, Shepherd's Bush Road, Bayswater Road, Cornhill, Commercial Road, East India Dock Road.	13·7	9
	Connecting route—			
141.	LIVERPOOL STREET... Victoria	Queen Victoria Street, Strand, Victoria Street ...	3·6	3
	Outlying route—			
145.	WORMWOOD SCRUBS Herne Hill	Wood Lane, Putney Bridge, St. John's Hill (Clapham Junction), Clapham Park Road, Dulwich Road.	10·6	6

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Omnibus Routes—continued.

Summary of the foregoing omnibus routes compared with routes in 1903 :— Omnibus routes.

Class of Routes.	Number of Routes.				*Aggregate* length of Routes.			
	1903.		1907.		1903.		1907	
	Horse.	Motor.	Horse.	Motor.	Horse.	Motor.	Horse.	Motor.
					miles.	miles.	miles.	miles.
Radiating	78	1	52	18	457	5	314	132
Through	21	—	16	10	140	—	100	99
Connecting	15	—	11	1	36	—	27	3
Outlying	43	1	37	1	146	3	128	11
Totals	157	2	116	30	779	8	569	245
	159		146		787		814	

The number of omnibuses licensed in Greater London in 1903 and 1907 was as follows :— Number of Omnibuses Licensed.

Year.	Horse omnibuses.	Motor omnibuses.	Total.
1903	3,623	13	3,636
1907	2,557	1,205	3,762

OMNIBUS SERVICES—LENGTH OF STREETS TRAVERSED.

Mileage of Omnibus Services.

8. Table showing approximately the length of streets in the County of London traversed by omnibuses in 1895, 1903, and 1907.

Royal Commission on London Traffic, Vol. III., Appendix 6, Table 22, page 151.

N.B.—The new figures are printed in *italics*.

Year.	North of the river.	South of the river.	Total	Increase or decrease during the period.	
	Miles.	Miles.	Miles.	Miles.	Per cent.
1895	121	58	179	—	—
1903	141	101	242	63	35·2
1907	*140*	*97*	*237*	*— 5*	*— 2·1*

The length of streets included above, traversed by motor omnibuses in December, 1907, is 83 miles on the north of the river, and 28 miles on the south—total 111 miles.

OMNIBUS COMPANIES—RESULTS OF WORKING.

Omnibus Companies—Results of Working.

9. Tables showing the results of the working of the two chief omnibus companies in recent years.

Royal Commission on London Traffic, Vol. III., Appendix 6, Tables 26 and 27, page 153.

N.B.—The new figures are printed in *italics*.

(1) *London General Omnibus Company.*

Receipts, expenditure, etc., in each of the ten years 1897 to 1906.

Year.	Receipts.	Expenditure.	Gross Profits.	Rate per cent. of dividend paid on ordinary shares.	Balance of reserve and renewal funds on 31st December.	Total amount of capital paid up.
	£	£	£		£	£
1897	1,080,699	973,259	107,440	10½	165,000	850,000
1898	1,144,027	1,054,555	89,472	10½	185,000	850,000
1899	1,205,644	1,116,357	89,287	10½	215,000	850,000
1900	1,245,174	1,157,918	87,256	10½	220,000	1,073,592
1901	1,221,771	1,187,111	34,660	5½	95.000	1,073,592
1902	1,244,663	1,206,199	38,464	5½	95,000	1,073,592
1903	1,261,562	1,172,728	88,834	7½	125,000	1,073,592
1904	*1,261,638*	*1,167,347*	*94,291*	*8*	*165,000*	*1,073,592*
1905	*1,245,671*	*1,180,389*	*65,282*	*7*	*173,528*	*1,073,593*
1906	*1,204,499*	*1,180,928*	*23,571*	*5½*	*143,355*	*1.203,592*

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Omnibus Co.'s.—Results of working.

(1.) *London General Omnibus Company*—continued.

Receipts, working expenses, and profit or loss per omnibus per day of the London General Omnibus Company for the five years 1902 to 1906.

—	Amount per omnibus per day.									
	1902.			*1903.*			*1904.*			*1905.*			*1906.*		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
Receipts from passengers	2	8	3·5	*2*	*7*	*10·6*	*2*	*7*	*2·0*	*2*	*6*	*6·5*	*2*	*6*	*4·8*
Working expenses	2	8	4·8	*2*	*6*	*0·8*	*2*	*5*	*1·5*	*2*	*5*	*7·3*	*2*	*7*	*0·2*
Profit (+) or loss (−) on passenger traffic	−0	0	1·3	+*0*	*1*	*9·8*	+*0*	*2*	*0·5*	+*0*	*0*	*11·2*	−*0*	*0*	*7·4*

NOTE.—The main part of the revenue, in addition to receipts from passengers is derived from advertising on the omnibuses.

(2.) *London Road Car Company.*

Receipts, Expenditure, &c., in each of the Ten Years 1897 to 1906.

Year.	Receipts.	Expenditure.	Gross profits.	Rate per cent. of dividend paid on ordinary shares.	Balance of reserve and renewal funds on 31st December.	Total amount of capital paid up.
	£	£	£		£	£
1897	348,281	302,873	45,408	9	61,418	444,000
1898	352,938	318,410	34,528	7¾	68,954	534,000
1899	381,784	337,053	44,731	9	74,191	534,000
1900	383,575	351,364	32,211	7½	74,274	534,000
1901	400,218	386,302	13,916	3	69,845	534,000
1902	436,700	399,335	37,365	5½	71,942	534,000
1903	432,176	389,556	42,620	6¾	81,373	534,000
1904	*423,164*	*389,013*	*39,151*	*7 1/12*	*92,795*	*534,000*
1905	*434,479*	*380,148*	*54,331*	*5 5/6*	*94,745*	*594,000*
1906	*443,097*	*415,873*	*27,224*	*2 1/12*	*100,045*	*637,478*

Receipts, working expenditure, and profit per omnibus per day of the London Road Car Company for the three years 1902 to 1904.

—	Amount per omnibus per day.					
	1902.	*1903.*	*1904.*	1905.	1906
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*		
Receipts from passengers	2 9 5·5	*2 8 11·0*	*2 7 4·5*	The number of omnibuses running in these years is not published.	
Working expenses	2 6 11·8	*2 5 11·1*	*2 4 11·5*		
Profit on passenger traffic	0 2 5·7	*0 2 11·9*	*0 2 5·0*		

NOTE.—The main sources of revenue, in addition to passenger fares, are advertising on the omnibuses and jobbing.

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Omnibus routes: (1) Crossing the river.

Omnibus Routes crossing the Bridges in 1907 (December) compared with Routes in 1903.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 13, *page* 144.

Bridge.	Number of Omnibus Routes.			
	1903 (Horse).	1907.		
		Horse.	Motor.	Total.
LONDON	18	19	1	20
WATERLOO	9	7	2	9
PUTNEY	4	4	3	7
WESTMINSTER	3	3	2	5
BLACKFRIARS	4	4	—	4
HAMMERSMITH	1	—	3	3
TOWER	2	2	—	2
VAUXHALL	2	1	1	2
WANDSWORTH	2	2	—	2
ALBERT	2	1	—	1
BATTERSEA	—	—	1	1
CHELSEA	2	1	—	1
BLACKWALL TUNNEL	1	1	—	1

(2) From Railway Termini.

Omnibus Routes from Railway Termini in 1907 (December), compared with Routes in 1903.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 14, *page* 145.

Railway Station.	Number of Omnibus Routes using Station as a Terminus.			
	1903 (Horse).	1907.		
		Horse.	Motor.	Total.
LIVERPOOL STREET	19	13	4	17
VICTORIA	17	11	6	17
LONDON BRIDGE	10	12	—	12
CHARING CROSS	7	6	1	7
WATERLOO	6	6	1	7
KING'S CROSS	6	4	—	4
EUSTON...	2	2	—	2
MARYLEBONE	3	2	—	2
BAKER STREET	1	1	—	1
PADDINGTON	1	1	—	1
ST. PANCRAS	1	1	—	1
EDGWARE ROAD	1	—	—	—
GOWER STREET	1	—	—	—

(3) Along Central London Railway Route.

Omnibus Traffic along Central London Railway Route in 1895, 1903, and 1908.

Royal Commission on London Traffic, Vol. III., Appendix 6, *Table* 21, *page* 151.

(Revised throughout).

Section of Route.	Length of Section.	Number of Ombibuses per hour both ways on Routes in Competition with Railway (during hours of full Service).				
		1895.	1903.	1908.		
				Horse.	Motor.	Total.
	Miles.					
SHEPHERD'S BUSH—NOTTING HILL GATE	1	44	50	60	50	110
NOTTING HILL GATE—MARBLE ARCH ...	1¼	48	40	40	50	90
MARBLE ARCH—OXFORD CIRCUS ...	¾	390	330	196	114	310
OXFORD CIRCUS—TOTTENHAM COURT ROAD.	½	296	298	238	94	332
TOTTENHAM COURT ROAD—BANK ...	1¾	206	278	214	94	308
	5¼					

Insanitary Areas Cleared by the Metropolitan Board of Works and the Council, and Sites for Re-housing Retained by the Council up to 31st March, 1907.

Royal Commission on London Traffic, Vol. III., Appendix No 6, Statement G.—Table II.

Name of Scheme.	Date.	Area.	Clearance. Gross cost of clearance.	Receipts from sale of surplus lands and incidentals.	Housing value of land devoted to re-housing.	Total deduction from gross cost of clearance.	Net cost falling on rates.	Number of persons of the working class displaced.	Re-housing. Housing value of land.	Cost of buildings.	Total.	Gross annual income from dwellings if all let.	Rent charged, average per room.	Number of persons of the working class re-housed (on the basis of 2 persons per room).
		Acres.	£	£	£	£	£		£	£	£	£	s. d.	
Tench Street, St. George-in-the-East	1883	2·73	52,637	646	(a)	646	51,991	1,228	(a)	—	—	—	—	—
Brook Street, Limehouse	1883	1·29	23,795	2,183	1,800	3,988	19,807	562	1,800	15,314	17,114	1,061	2 7¾	308
Trafalgar Road, Greenwich	1883	·91	20,700	2,924	1,000	3,024	17,676	378	1,000	12,298	13,298	942	2 4½	306
Hughes Fields, Deptford	1884	6·96	91,978	8,893 (b)	3,720 1,460 (c)	14,073	77,905	1,786	3,720	35,756	39,476	2,050	2 4½	666 (c)
Cable Street, Shadwell	1886	1·98	46,390	1,495	3,660	5,155	41,235	970	3,660	37,592	41,252	2,955	2 10	800
Shelton Street, St. Giles	1886	1·64	79,554	2,435 (b)	8,850	11,285	68,269	1,208	8,850	42,457	51,307	4,417	3 5¾	629 (g)
Boundary Street, Bethnal Green (including Goldsmith Row, Shoreditch).	1890	14·85	358,140	27,185 (b)	63,010	90,195	267,945	5,719	63,010	282,655	345,665	22,045	3 0¾	5,524
Brooke's Market, Holborn...	1891	·54	8,930	108	750	858	8,072 (d)	55	750	3,017	3,767	289	3 8½	60
Mill Lane, Deptford	1892	1·98	23,341	497	3,200	3,697	19,644 (d)	715	3,200	59,946	63,146	7,766	2 6	946 (g)
Ann Street, Poplar	1893	·75	11,090	75	2,260	2,355	8,755 (d)	261	2,260	23,812	26,072	2,137	2 7¼	630
Falcon Court, Southwark	1895	1·49	50,539	18,381 (b)	7,100	25,481	25,058 (d)	820	7,100 (f)	37,021	44,121	3,000	3 4¾	680
Churchway, St. Pancras	1895	1·98	43,201	2,569 (b)	8,550	11,119	32,082	1,095	8,550	39,127	47,677	3,894	3 7¼	892
Clare Market, Westminster	1895	5·23	422.661	326,640	19,106	345,746	7 ,915	3,088	19,106 (f)	102,506	121,612	9.495	3 2¼	2,286
Burford's Court, &c., Poplar	1899	·89	12,813	1,230 (b)	1,434	2,714	10,099	269	1,434 (f)	11,410	12,844	821	2 4¼	259
Nightingale Street, St. Marylebone (e)	1899	·83	—	—	—	—	—	558	—	—	—	—	—	—
	—	44·10	1,245,769	394,416	125,900	520,316	725,453	18,712	124,440	702,911	827,351	60,872	—	13,936
Garden Row, &c., St. Luke	1899	2·62	Now being dealt with.											
Aylesbury Place, Clerkenwell and **Union Buildings**, Holborn.	1900	2·76												
Webber Row, &c., Southwark	1899	5·16												
Providence Place, Poplar	1901	·87												
	—	55·51												

(a) Tench Street—The whole site cleared by this scheme is used as a public recreation ground.
(b) The receipts for these schemes include the estimated value of portions of the sites remaining unsold, as follows:—Hughes Fields, £1,237; Shelton Street, £150; Boundary Street, £8,832; Falcon Court, £17,440; Churchway, £2,420; Burford's Court, &c., £1,200.
(c) Hughes Fields—This is the amount received for land sold subject to an obligation to re-house 240 persons in addition to the number shown in the last column of the table.
(d) In these schemes part of the cost shown was borne by the local authority of the district, as follows:—Brooke's Market, £3,000; Mill Lane, £10,478; Ann Street, £4,400; and Falcon Court, £7,750.
(e) Nightingale Street—This scheme was carried out by, and at the expense of, Lord Portman with the assistance of the Council's compulsory powers for the acquisition of the property.
(f) In these cases no re-housing accommodation was provided on the site of the clearances, but other sites were purchased for the purpose.
(g) Including 345 persons accommodated in Parker Street Lodging House, and 802 persons in Carrington House, Mill Lane, Deptford.

MR. EDGAR HARPER.

Sites acquired for working-class Dwellirgs.

Sites acquired by the Council for the erection of Working-class Dwellings apart from its Re-housing Obligations.

Royal Commission on London Traffic, Vol. III., Appendix No. 6, Statement G., Table III.

Estate.	When acquired.	Area.	Number of persons for whom accommodation has already been provided.	Number of persons for whom accommodation is to be provided.	Total.	Total actual or estimated cost of land and building.
		Acres.				£
						Actual.
Dufferin Street Dwellings, St. Luke.	1891	—	174	—	174	6,615
Millbank Estate, Westminster (part).	1893	—	230	—	230	12,948
Green Street and Gun Street, Southwark.	1895	½	418	—	418	24,935
Holmwood Buildings, Southwark.	1899	—	72	—	72	5,228
Wedmore Street, Islington ...	1901	1¼	1,050	—	1,050	57,695
Hughes Fields, Deptford ...	1903	¾	440	—	440	17,230
						Estimated.
Totterdown Fields, Tooting...	1900	38¾	5,074	3,358	8,432	400,238
Norbury Estate, Croydon ...	1901	29½	732	4,768	5,500	250,000
White Hart Lane, Tottenham	1901	225½	1,986	40,514	42,500	1,900,602
Caledonian Estate, Islington	1902	2	1,384	—	1,384	73,896
Old Oak Common, Hammersmith.	1902	54½	—	9,200	9,200	450,000
Brixton Hall, Lambeth ...	1903	1	718	—	718	36,500
Total	—	353½	12,278	57,840	70,118	3,235,837

MR. G. L. GOMME.

Improvements.

APPENDIX C.—v.

LOCOMOTION AND TRAFFIC.

Supplementary Statement to the evidence given before the Royal Commission on London Traffic by the Clerk of the Council.

COUNTY AND LOCAL IMPROVEMENTS.

Improvements completed or practically completed.

In the evidence which, in June, 1903, I laid before the Royal Commission on London Traffic it was stated that the Council had completed 19 improvements. The estimated total gross cost of these was £1,122,849, the estimated value of the surplus land £120,654, and the estimated net cost £1,002,195. Since that date the following improvements, numbered 20 to 55 have been completed, or practically completed, and those numbered 56 to 94 are now in course of execution.

Royal Commission on London Traffic, Vol. III., Appendix No. 5, pp. 110–113.

Improvement.	Parliamentary authorisation.	Metropolitan Borough and its contribution.	Actual or estimated gross cost.	Actual or estimated re-coupment.	Actual or estimated net cost	Actual or estimated net cost to the Council after deducting contributions.	Length of improvement.	Average width of new street or widened thoroughfare.
			£	£	£	£	feet	feet
20. St. George's Place, Knightsbridge.	London Council (General Powers) Act. 1891.	Westminster—¼ .	32,067	—	32,067	24,050	400	70
21. Long Lane	London County Council (Improvements) Act. 1897.	Southwark—Nil.	207,400	17,000	190,400	190,400	1,100	50
22. Wandsworth Road ..	London County Council (Improvements) Act, 1899.	Lambeth—Nil ..	63,000	8,000	55,000	55,000	800	60
23. Brixton Road, between Cranmer Road and Camberwell New Road.	London County Council (General Powers) Act, 1901.	Lambeth—Nil ..	13,200	—	13,200	13,200	600	70
24. Harleyford Street ..	London County Council (Tramways and (Improvements) Act, 1901.	Lambeth—Nil ..	16,900	—	16,900	16,900	400	60
25. Battersea Park Road	London County Council (General Powers) Act, 1897.	Battersea—¼ ..	20,930	500	20,430	15,322	400	—
26. York Road	London County Council (General Powers) Act, 1898.	Battersea portion—¼, London County Council—¾; Wandsworth portion—¼, London County Council—¾.	87,150	7,000	80,150	60,113	3,500	45
27. Albert Embankment.	Ditto	Lambeth—Nil ..	37,100	3,100	34,000	34,000	450	60
28. Rosemary Branch Bridge.	Ditto	Shoreditch—¼ .. Hackney—¼ .. Islington—Nil..	10,485	—	10,485	6,985	100	60
29. Strand at Holywell Street.	London County Council (Improvements) Act, 1897.	Westminster—Nil	569,130	—	569,130 New street.	569,130	640	130
30. Holborn to Strand (Kingsway and Aldwych) and Clare Market clearance scheme.	London County Council (Improvements) Act, 1899, Housing of the Working Classes Act, 1890, and London (Clare Market, Strand) Improvement Scheme, 1895.	Holborn and Westminster — Nil.	4,866,000	4,091,800	774,200	774,200	3,300	100
		Westminster—Nil	397,900	181,400	Clearance scheme. 216,500	216,500	—	—
31. High Holborn at Nos. 107 to 113.	Metropolis Management Acts, 1855 and 1862.	Holborn—Nil ..	29,850	13,200	16,650	16,650	140	70
32. Southampton Row, between High Holborn and Theobald's Road.	London County Council (Improvements) Act, 1899.	Holborn—Nil ..	272,000	110,000	162,000	162,000	500	80
33. Southampton Row (west side), between Fisher Street and Theobald's Road.	London County Council (Tramways and Improvements) Act, 1903.	Holborn—Nil ..	40,350	—	40,350	40,350	This improvement is an extension of previous scheme in order to provide for the construction of an approach to the tramway subway, 20 feet wide, without curtailing the width of the road available for ordinary traffic.	
34. Kensington High Street.	London County Council (Improvements) Act, 1899.	Kensington—¼ ..	405,000	317,500	87,500	58,333	600	60
35. Cat and Mutton Bridge and approaches.	London County Council (Improvements) Act, 1899.	Shoreditch—about ⅓, less ⅓ by Hackney; Bethnal Green—Nil.	71,800	3,300	68,500	51,500	700	50
36. Mare Street	London County Council (Improvements) Act, 1900.	Hackney—¼ ..	660,750	84,650	576,100	451,100	3,500	70
37. Goswell Road	Ditto	Finsbury—about 1/16.	227,800	18,300	209,500	189,500	1,600	60
38. St. John Street ..	Ditto	Finsbury—Nil ..	92,400	13,000	79,400	79,400	450	60
39. Archway Road ..	Ditto	Islington—Nil ..	6,000	—	6,000	6,000	350	60

Improvements completed or practically completed—continued.

Improvement.	Parliamentary authorisation.	Metropolitan Borough and its contribution.	Actual or estimated gross cost.	Actual or estimated re-coupment.	Actual or estimated net cost.	Actual or estimated net cost to the Council after deducting contributions.	Length of improvement.	Average width of new street or widened thoroughfare.
			£	£	£	£	feet	feet
40. Kentish Town Road..	London County Council (Improvements) Act, 1900.	St. Pancras—Cost of paving, *i.e.*, ⅓.	10,450	—	10,450	7,300	350	60
41. Battersea Rise ..	Ditto	Battersea—about ⅓.	46,900	3,000	43,900	36,400	1,200	50
42. Blackheath Road, Blackheath Hill, and New Road.	Ditto	Greenwich and Woolwich—Nil.	41,200	1,500	39,700	39,700	700	55
43. High Street and Gardener's Lane, Putney.	Ditto	Wandsworth—about ⅔.	48,030	12,000	36,030	15,000	500	50
44. Central Street	London County Council (General Powers) Act, 1901.	Finsbury—about ⅓.	88,250	3,500	84,750	69,750	900	50
45. Red Lion Street, South Street, Garratt Lane, Defoe Road, and High Street, Tooting.	London County Council (Tramways and Improvements) Act, 1901.	Wandsworth—½ .	285,250	11,300	273,950	182,633	13,200	54
46. Merton Road (renamed Tooting High Street).	Ditto	Wandsworth—½ .	40,000	12,000	28,000	18,667	600	54
47. Old Street, between Hoxton Street and No. 341, Old Street.	Metropolis Management Acts, 1855 and 1862.	Shoreditch—Nil .	14,250	—	14,250	14,250	240	60
48. Cambridge Road ..	Metropolis Management Acts, 1855 and 1862, and General Paving (Metropolis) Act, 1817.	Bethnal Green—¼	50,000	1,400	48,600	36,450	740	70
49. Hampstead Road ..	London County Council (Tramways and Improvements) Act, 1902.	St. Pancras—⅛ ..	245,500	20,000	225,500	197,312	400	80
50. Queen's Road, Peckham.	Ditto	Camberwell—⅓..	6,320	—	6,320	4,213	800	54
51. Denmark Hill, Champion Park, Grove Lane, Dog Kennel Hill, Grove Vale and Lordship Lane.	Ditto	Camberwell portion —⅓. Lambeth—Nil.	119,900	4,950	114,950	81,617	7,500	50
52. Piccadilly, between Arlington Street and the Green Park.	Metropolis Management Acts, 1855 and 1862.	Westminster—1/11 Owners of adjacent property—10/11.	45,000	—	45,000	39,000	300	85
53. Sloane Street, between Basil Street and Brompton Road.	Ditto.	Chelsea—about ⅓ and to do paving works.	60,000	—	60,000	40,000	180	60
54. Bow Bridge	County Bridges Acts, 1803 and 1814, and Local Government Act, 1888.	Lee Conservancy Board—£5,000. West Ham—£6,064 Poplar—Nil.	22,919	—	22,919	11,855	—	—
55. Victory Bridge, Ben Jonson Road.	London County Council (General Powers) Act, 1905.	Stepney—¼ ..	17,000	—	17,000	12,750	—	—
		Totals ..	9,268,181	4,938,400	4,329,781	3 837,410	47,140 (About 9 miles.)	feet

Improvements now being executed.

			£	£	£	£	feet	feet
56. Tower Bridge northern approach (Tower Hill to Prescot Street).	London County Council (Improvements) Act, 1897.	Stepney—Nil ..	414,000	23,500	391,500	391,500	800	80
57. Mansell Street (continuation of the northern approach to the Tower Bridge).	Metropolis Management Acts, 1855 and 1862.	Ditto ..	113,675	10,900	102,775	102,775	1,100	50
58. Mansell Street and Great Prescot Street.	Ditto	Ditto ..	3,200	—	3,200	3,200	38	68
59. Southampton Row, between Vernon Place and Bloomsbury Place.	London County Council (Tramways and Improvements) Act, 1903.	Holborn—Nil ..	165,500	19,000	146,500	146,500	400	70
60. Southampton Row, at Nos. 67, 69, and 71, and at Nos. 83, 85, and 87.	Metropolis Management Acts, 1855 and 1862.	Ditto ..	2,500	—	2,500	2,500	130	70
61. Thames Embankment extension and Westminster improvements at Millbank (Westminster improvement).	London County Council (Improvements) Act, 1900.	Westminster—about ⅓.	1,321,750	735,750	586,000	486,000	1,500	70
62. Nine Elms Lane ..	Ditto	Battersea—about 1/10.	174,100	13,800	160,300	145,300	2,800	50
63. Blackheath Road, Blackheath Hill, and New Road.	London County Council (Improvements) Act, 1900.	Greenwich—Nil	41,200	1,500	39,700	39,700	700	55
64. Camberwell New Road.	London County Council (Tramways and Improvements) Act, 1901.	Camberwell—about 1/10.	72,000	15,500	56,500	51,500	300	60
65. Fulham Palace Road, High Street, and Church Street.	London County Council (Tramways and Improvements) Act. 1902.	Fulham—about ⅓	137,226	36,624	100,602	70,802	2,600	High Street 60 Remainder 50
66. Queen Street, Hammersmith.	Ditto	Hammersmith—about ⅓.	4,810	—	4,810	3,394		
67. Wimbledon Road ..	London County Council (Tramways and Improvements) Act, 1903.	Wandsworth—Nil.	5,300	--	5,300	5,300	1,000	54
68. Brook Green Road and Scrubs Lane.	Ditto	Hammersmith—⅓	53,000	—	53,000	35,334	3,000	50

Mr. G. L. Gomme.

Improvements.

Improvements now being executed—continued.

Improvement.	Parliamentary authorisation.	Metropolitan Borough and its contribution.	Actual or estimated gross cost.	Actual or estimated re-coupment.	Actual or estimated net cost.	Actual or estimated net cost to the Council after deducting contributions.	Length of improvement.	Average width of new street or widened thoroughfare.
			£	£	£	£	feet.	feet
69. Piccadilly, between Sackville Street and Piccadilly Circus.	Metropolis Management Acts, 1855 and 1862.	Westminster—about ½.	209,500	—	209,500	169,500	600	80
70. Piccadilly, between St. James's Street and Duke Street.	Ditto	Westminster—about ½.	73,700	—	73,700	63,907	410	80
71. Piccadilly, west of St. James's Street.	Ditto	Westminster—½..	30,450	—	30,450	26,100	65	80
72. Lordship Lane and London Road.	London County Council (Tramways and Improvements) Act, 1904.	Camberwell portion—½. Lewisham portion—½.	21,550	—	21,550	14,387	4,250	Varying from 50–80
73. Malpas Road, Brockley Road, Brockley Rise and Stanstead Road.	Ditto	Deptford portion—½. Lewisham portion—½.	104,000	700	103,300	68,867	7,400	50
74. Lewisham High Road, Loampit Hill, Loampit Vale, Lee High Road.	Ditto	Deptford portion—½. Lewisham portion—½.	139,870	4,700	135,170	90,114	4,950	Varying from 50–80
75. High Street and Lewisham Road.	Ditto	Lewisham—½ ..	20,600	50	20,550	13,700	1,700	Do.
76. High Street, Lewisham and High Road, Lee.	Metropolis Management Acts, 1855 and 1862.	Lewisham—½ ..	1,250	—	1,250	834	160	46
77. Bostall Hill, Basildon Road, McLeod Road and Knee Hill.	London County Council (Tramways and Improvements) Act, 1904, and Metropolis Management Acts, 1855 and 1862.	Woolwich—½ ..	16,900	200	16,700	11,134	4,500	54
78. York Road	Metropolis Management Acts, 1855 and 1862.	Wandsworth—½..	19,270	—	19,270	12,847	1,700	54
79. Falcon Road	London County Council (Tramways and Improvements) Act, 1906.	Battersea—½ ..	5,900	—	5,900	3,934	190	50
80. Torrington Square and Montague Place.	Metropolis Management Acts, 1855 and 1862.	Holborn—⅔ ..	10,000	—	10,000	6,000	440	130
81. South Lambeth Road, near Vauxhall Park.	London County Council (Tramways and Improvements) Act, 1907.	Lambeth—½ ..	15,700	3,000	12,700	8,467	430	54
82. South Lambeth Road, at Binfield Road.	Ditto	Lambeth—Nil ..	520	—	520	520	100	100
83. Stockwell Road and Brixton Road.	Ditto	Lambeth—½ ..	1,050	—	1,050	700	55	87
84. South Lambeth Road to Norwood Road.	Ditto	Ditto ..	51,450	2,720	48,730	32,487	—	—
85. Necker Bridge ..	London County Council (General Powers) Act, 1907.	Deptford—½ ..	8,000	—	8,000	4,000	—	—
86. Bridge carrying Catford Hill over the river Ravensbourne and the South Eastern Railway.	South Eastern and London, Chatham, and Dover Railway Companies Act, 1900, and London County Council (General Powers) Act, 1905.	Deptford—½ .. Lewisham—½	5,483	—	5,483	2,742	—	—
87. Holloway Road and Camden Road.	Metropolis Management Acts, 1855 and 1862.	Islington—Nil ..	160	—	160	160	Corner rounded off.	
88. Roe Bridge, Mitcham Lane.	Local Government Act, 1888, and Metropolis Management Act, 1855.	Wandsworth—Nil. Surrey County Council—½.	750	—	750	375	—	50
89. South Lambeth Road, between Wheatsheaf Lane and Old South Lambeth Road.	Metropolis Management Acts, 1855 and 1862.	Lambeth—⅔ ..	1,325	—	1,325	884	190	54
90. Holloway Road and Parkhurst Road.	Ditto	Islington—Nil ..	320	—	320	320	Corner rounded off.	
91. Stanley Bridge, King's Road.	Ditto	Chelsea—½ .. Fulham—⅓ ..	22,450	—	22,450	14,967	700	60
92. Farringdon Road ..	Ditto	Finsbury—⅓ ..	1,750	—	1,750	1,167	210	60 } 50–120 }
93. Marble Arch	Metropolis Management Acts, 1855 and 1862.	Westminster—½.. St. Marylebone—½ Paddington—⅙ ..	19,000	—	19,000	12,667	480	—
94. Holloway Road and Pemberton Gardens	Ditto	Islington—Nil ..	185	—	185	185	Corner rounded off.	
		Totals ..	3,289,394	866,944	2,422,450	2,043,850	42,898 (about 8 miles.)	feet

The Council has therefore effected, or is the course of carrying out, 94 improvements estimated to cost £7,754,426 net.

The Council has also agreed to contribute the sum of £1,029, 318 8*s.* 4*d.* towards the cost of 462 smaller improvements carried out by the local authorities in London.(1) The total net amount to which the Council is committed, therefore, in connection with improvements since its constitution in 1889 is now (February, 1908), £8,783,744 8*s.* 4*d.*, or nearly £8,800,000, without deducting the contributions to be made by certain local authorities, or an average of £463,092, or nearly £24,373 per annum. This £8,800,000 will involve an annual charge on the rates for interest on and repayment of debt of about 2½*d.* in the £, which will diminish annually until the amount is paid off; this is calculated upon the rateable value at the present time (1908). The total length of the improvements undertaken by the Council is about 19½ miles.

G. L. Gomme,
Clerk of the Council.

County Hall,
15*th February*, 1908.

(1) See *ante*, Report, p. 12.

APPENDIX C.—VI.

MR. M. FITZ-MAURICE.

Smaller Improvements by local authorities

(1.) List of Improvements carried out by the Borough and City Councils from 1903 to 1907 inclusive.

No.	Year.	Borough Council.	Improvement.	Cost. £	s.	d.
1	1907	Battersea ...	Falcon Road, between Falcon grove and Este Road ...	5,531	17	2
*2	1905	Do. ...	Latchmere Road to Theatre Street—new street 40 feet wide.	1,332	15	8
	1905	Do. ...	Latchmere Road, between Kathleen Road and Lavender Hill.			
3	1905	Camberwell ...	Queen's Road, Peckham, at Nos. 25 and 27	200	0	0
4	1905	Chelsea	Beaufort Street, at junction in King's Road	856	0	0
5	1905	Do.	King's Road, Chelsea, at Nos. 157 to 165, 204 to 230, and 303 to 341.	3,921	0	0
6	1906	City Corporation, The.	Blomfield Street and London Wall, between Finsbury House and Circus Place, and East Street and Eldon Street.	91,423	0	0
7	1903	Do. ...	Fleet Street, at Nos. 82 to 88 and 90 to 97, between Bride Lane and Salisbury Court.	111,553	6	4
8	1906	Do. ...	Lothbury, between Old Jewry and Princes Street ...	39,860	9	11
*9	1904	Deptford ...	Shardeloes Road, Brockley	4,577	0	5
*10	1904	Finsbury ...	Great Arthur Street...	1,702	5	4
*11	1905	Do. ...	Do. (further widening)...	1,425	0	0
12	1906	Do. ...	Rosoman Street, Clerkenwell, between Skinner Street and Middleton Street.	2,133	3	2
13	1906	Do. ...	Whitecross Street, at Nos. 70 to 76	765	16	6
14	1907	Fulham	Fulham Palace Road, setting back wall at the Convent of the Good Shepherd.	250	0	0
*15	1904	Do.	Fulham Palace Road, between Childerley Street and Lainbrook Terrace, say—	200	0	0
16	1903	Do.	Fulham Road, between Britannia Road and Cedar Road	4,058	3	3
*17	1903	Greenwich ...	Maze Hill	1,997	6	4
18	1904	Hackney... ...	Kingsland Road High Street, at Nos. 41 to 43 and 45...	1,150	0	0
19	1903	Do.	Millfields Road, Clapton	750	0	0
*20	1905	Do.	Oldhill Street, Clapton, for a distance of 482 feet ...	800	0	0
21	1906	Hammersmith ...	Great Church Lane, between Fulham Palace Road and 61, Great Church Lane.	12,177	11	9
22	1903	Hampstead ...	Frognal Gardens Toll Gate, &c.	383	11	7
23	1905	Kensington ...	Brompton Road, near Brompton Square, between Brompton Square and 186, Brompton Road.	15,623	14	8
*24	1904	Do. ...	Church Street (by Silver Street)	7,863	0	0
25	1907	Do. ...	High Street, Notting Hill, at Nos. 11 to 19 and 21 to 35	22,043	11	4
26	1904	Do. ...	Old Brompton Road, at Sussex Place	729	5	4
*27	1903	Lewisham ...	Ennersdale Road to Nightingale Grove, Lewisham—new street 40 feet wide.	959	5	9
28	1903	Do. ...	High Road, Lee, at Nos. 102 to 124	2,744	4	9
*29	1903	Do. ...	Ivy Lane, at junction in Ladywell Road, widening to 30 feet.	231	14	10
*30	1904	Do. ...	Porson Street, between Elmira Street and Ellerdale Street	217	8	10
*31	1904	Do. ...	Southend Lane	196	1	1
*32	1905	Do. ...	Willow Walk, Rushey Green, Nos. 27 to 33	60	15	1
33	1903	Limehouse ...	Wapping Wall, between No. 29 and Monza Street ...	999	12	3
34	1907	Poplar	Emmett Street, at Pier Wharf	128	6	0
35	1905	Do.	Emmett Street, Poplar	479	17	4
*36	1904	St. Pancras ...	Longford Street	2,707	15	0
37	1905	Southwark ...	Union Street, Southwark, between Redcross Street and Worcester Street.	2,126	1	9
38	1906	Stepney	Bell Lane, Whitechapel	3,255	6	0
39	1905	Do.	Castle Alley, Whitechapel, 59 feet from Whitechapel High Street.	3,586	17	0
*40	1903	Do.	Dean Street, between Blakesley Street and Tarling Street	2,978	9	9
*41	1903	Do.	Mile End Road, at "Vine Tavern"	5,839	2	10
42	1906	Do.	Narrow Street, between "Barley Mow" Public-house and Three Colt Street, at No. 107.	18,295	15	5
43	1906	Do.	Three Colt Street, at Nos. 60, 62, and 64...	1,978	7	8
*44	1904	Stoke Newington	Albion Road to Church Path, Town Hall Approach ...	411	16	3
*45	1905	Wandsworth ...	Blackshaw Road, Tooting, to the west of Tooting High Street.	1,542	11	6
*46	1903	Do. ...	Cavendish Road, Balham	1,385	11	0
*47	1906	Do. ...	Church Lane, Tooting	1,998	5	10
48	1907	Do. ...	High Street, at No. 144	75	0	0
49	1904	Do. ...	Lower Richmond Road, between Draw Dock and Bemish Road.	9,319	5	1
*50	1905	Do. ...	Merton Road, Wandsworth Junction, at West Hill Road	513	0	11
51	1907	Do. ...	North Street and Rectory Grove	7,265	8	5
52	1905	Do. ...	South Street, Wandsworth, at "Waggon and Horses" Public-house.	114	4	1
53	1906	Do. ...	Streatham High Road, at Drew Estate, between Mount Ephraim Road and Tate Gallery.	6,106	2	7
54	1905	Do. ...	Tooting High Street, at St. Leonard's Estate	1,124	10	0
55	1906	Do. ...	Tooting High Street, between "Castle" Public-house and Defoe Road.	11,125	12	2
56	1906	Do. ...	Upper Tooting Road, near "Wheatsheaf" Public-house	168	13	2
57	1906	Westminster, City	Great Smith Street, at Nos. 14 to 22	1,969	3	10
*58	1903	Do. ...	Lisle Street, Charing Cross Road, between Ryder's Court and Portobello Passage.	2,709	0	2
59	1907	Do. ...	Russell Street, Catherine Street to Drury Lane ...	19,310	1	7
60	1904	Do. ...	Strand, at No. 89 to 104	92,163	17	11
61	1903	Woolwich ...	Herbert Road...	872	14	4
62	1905	Do. ...	Lodge Lane, between Plumstead Cemetery and Long Lane	298	0	6
63	1907	Do. ...	New Road and Thomas Street	229	13	6
*64	1903	Do. ...	Red Lion Lane, south of Constitution Hill	120	0	0
*65	1903	Do. ...	Wickham Lane, Plumstead...	36,000	0	0

(1) See *ante*, Report, p. 12.

* To Improvements thus indicated the L.C.C. did not contribute.

APPENDIX C.—VII.

Supplementary Statement to the Evidence given before the Royal Commission on London Traffic by the Superintending Architect of the London County Council.

Royal Commission on London Traffic, Vol. III., Appendix No. 11, pp. 309–314.

Streets.

MR. W. E. RILEY. Superintending Architect, L.C.C.

The report of the Royal Commission clearly indicates that the Commissioners regarded the question of street accommodation as the dominating factor in the problem of London traffic.

The Commissioners, in Chapter II. of their report, allude to "the fundamental difficulty in the way of improving the means of locomotion in London, viz., the insufficiency of street accommodation and the fact that streets were not originally laid out on any general plan."

The recommendations of the Commission also commence with the statement that "at the root of the problem of London locomotion lies the fact that many of the streets are too narrow."

Abundant confirmation of these conclusions is found by a reference to the map of London which has been prepared to indicate streets 60 ft. and upwards in width.(1)

The map shows that streets have not been widened in accordance with any comprehensive scheme, and, while useful for local purposes, have no place in any general scheme for facilitating traffic.

To prevent a recurrence of the evils due to the past haphazard development of London, the Commissioners state that "the point is, to secure that in future, new streets shall be constructed and improvements in old streets effected in relation to the general needs of London and in pursuance of a fixed policy." They also refer to the conclusion of the Advisory Board of Engineers, that street improvements should be undertaken in conformity with a carefully considered plan.

The Commissioners reported on 26th June, 1905, but at present nothing has been done to prepare such a plan.

Urgent need for general plan.

The need for steps to be taken in this direction is urgent, in order to prevent the creation of further obstacles to the future widening of existing streets, and to ensure that new streets may be laid out so as to co-ordinate with a general scheme.

Prince's Street, Westminster.

As an example of this necessity, the case of Prince's Street, Westminster, may be quoted. The Engineer to the Westminster City Council suggested in evidence to the Commission that, in order to provide a direct route for light traffic from Westminster in the direction of Charing Cross, Waterloo Place, and Regent Street, Prince's Street should be widened throughout. The Advisory Board of Engineers supported the suggestion, which was adopted by the Commission.

Prince's Street is a narrow thoroughfare leading from Victoria Street to Great George Street and Storey's Gate, having a width at the north end of 27 ft. 6 in., in the centre 53 ft., and at the south end of 28 ft. In connection with a scheme for extension of Government offices, H.M. Office of Works propose to acquire property at the north end of the street on the east side, and to widen the street to 50 ft. At the south end, however, buildings are being re-erected on the Royal Aquarium site which, if proceeded with, will prove a serious obstacle to a widening of the street at that end, and to the carrying out of the recommendations of the Commission.

Marylebone Road, Euston Road, and Pentonville Road.

A further example is the case of Marylebone Road, Euston Road, and Pentonville Road. An Act of 1756 prohibited the erection of buildings within 50 feet of the highway in Pentonville, Euston, and Marylebone Roads, which thoroughfares were to be 60 feet wide. This Act has, however, fallen into abeyance, and in many cases the forecourts have been built over and one-storey shops erected thereon. At other places, for a short length, three or four storied houses have been built so as to contract the width of the thoroughfare to 48 ft. from house to house.

There is little doubt that the Act of 1756 contemplated that these roads would form an important main thoroughfare, and an exceptional opportunity is afforded for the formation of a wide street three miles in length at a comparatively small cost. The Advisory Board of Engineers considered that the principle of the Act of 1756 should be acted on; that where necessary adjoining properties should be acquired under renewed powers, and that, as a provision for the future, no further building on the forecourts or gardens within 50 ft. of the centre should be permitted, compensation being paid for interference with such private rights as may exist. The Commission attached considerable importance to this proposal.

(1) A map prepared by the London County Council.

MR. W. E. RILEY.
Superintending Architect, L.C.C.

Repeated attempts have been made to erect buildings on the forecourts abutting on Euston, Marylebone, and Pentonville Roads, and various applications have been made to the Council in respect thereto. On 9th April, 1889, the subject of preventing building encroachments in Euston Road and Marylebone Road was referred by the Council to the Building Act Committee for consideration, and a policy was adopted not to authorise any similar encroachments in these roads. This policy has been followed most consistently.

In two recent applications for the Council's consent to build in advance of the main line of buildings in Euston Road and Pentonville Road, the Superintending Architect was requested to define the general line, which he indicated to be the line of the main buildings 50 ft. from the highway. An appeal was made to the Tribunal of Appeal, who varied the Superintending Architect's certificate by defining the general line to be the line of projecting one-storey buildings. Both cases are still *sub judice*, but if the line defined by the Tribunal is upheld, further obstacles to the scheme suggested by the Commission will be created, as buildings could be erected to a height of 80 ft. in place of the existing one-storey shops.

Extent of building in London.

To illustrate the extent to which building is proceeding in London, the following approximate figures may be quoted :—

—	1897.	1898.	1899.	1900.	1901.	1902.	1902.	1904.	1905.	1906.
New buildings (taken from district surveyors' returns).	8,747	7,133	8,182	7,389	7,941	7,543	7,082	6,906	6,835	7,191
Length of streets sanctioned (miles).	14	17	23	16¾	9½	15½	15¾	7½	12	8½

This enormous development has had no controlling direction, and the meagre powers exercised by the Council under Part II. of the London Building Act provide only for a minimum standard.

The Commissioners recommended that steps be at once taken to prevent the creation of further obstacles to the future widening of existing streets, viz., by preventing building on gardens and forecourts in streets where a greater width than at present is desirable, and that for this purpose a change in the law may be necessary.

The preparation of a general plan and the evolution of a comprehensive scheme would require most careful consideration. It would probably involve a survey of the whole county with regard to prospective requirements, with a view to the prohibition of building in narrow streets and so as to obtain a thoroughly satisfactory general design.

Responsibility for preparation of general plan.

The question obviously arises as to who should be responsible for the preparation of the plan. It would appear that there can be no improvement in the condition of London traffic without expenditure out of the rates, and no authority but an elected body could throw any burden on the ratepayers. The functions of the proposed Traffic Board are purely advisory, and such a board could not, it is thought, make any mandatory recommendations.

The Advisory Board of Engineers reported that the plan should be undertaken by those responsible for the work, and as the Council and its predecessors expended a net sum of £16,246,521 on street and bridge improvements between the years 1856 and 1904, the Advisory Board appear to have contemplated that the duty of the preparation of a comprehensive plan would devolve on the Council, possibly after consultation with local authorities such as the Corporation of London.

Whatever authority may eventually be decided upon to undertake the preparation of a general plan, it should be considered whether, from the amount of rebuilding in important thoroughfares and the large extent to which suburban areas in the county are being developed, the question is not an urgent one, demanding immediate attention.

Artistic aspect should receive consideration in general scheme.

An important branch of the subject which should receive consideration in any comprehensive scheme for street development and improvement is the artistic or æsthetic side. Such a scheme should ensure not only that streets should be broad and well laid out, but that the general effect should be harmonious.

The laying out of new and the widening of existing thoroughfares should be considered in relation to important buildings, monuments, and open spaces, due regard being paid to questions of vista and perspective. This principle is one which has usually received more attention abroad than in England.

In the case of Paris, a Commission of Artists in 1793 laid down various improvements which then seemed to be desirable, this scheme being amplified in 1854 under M. Haussmann. A study of later designs for city development shows that the system of wide streets radiating from focal centres is now generally regarded as more convenient and acceptable than the adoption of rectangular blocks of streets and buildings. The City of Washington has been evolved with great success from the plans prepared by L'Enfant at the direction of General Washington in 1792, a width of 160 ft. being apparently accepted as a standard of laying out the main avenues radiating from centres.

MR. W. E. RILEY. Superintending Architect, L.C.C.

Paris was remodelled on the same lines, and a recent report on the rebuilding of San Francisco suggests similar principles.

The memorandum forwarded by me to the Commission in 1904 as to the width of streets in foreign cities and the plans then obtained show that increased width of streets is being provided in rebuilding such cities, and that the radiating system is being followed to a large extent.

Powers of the Council under the London Building Act as to the width of streets and height of buildings.

Attention should be directed to the powers exercised by the Council under the London Building Act, 1894, with regard to streets and the height of buildings.

Except in the case of streets constructed under special statutory powers, the Council's sanction is required to the formation of any new street in the County of London, and such sanction may be refused where a street intended for carriage traffic is proposed to be less than 40 ft. wide, or for foot traffic less than 20 ft. wide, or where direct communication between two carriage streets is not provided; or where a street (except in the City) would form a cul-de-sac; or where the gradient would be steeper than 1 in 20. (Section 9.)

If this minimum standard be observed the Council can require nothing further, and even the provision of convenient communications between adjoining estates can be evaded if the minimum standard is observed.

In the London Building Acts (Amendment) Bill, 1905, the Council sought power to refuse to sanction streets less than 50 ft. wide, or where suitable communications between adjoining estates are not provided; also to vary the direction of new streets and to require the provision of intersecting or cross streets. These powers are already possessed by many provincial authorities.

Clause 31 of the same Bill would have empowered the Council to define a building line (to which existing buildings might be set back) on either side or both sides of a street, not more than 75 ft. from the centre of a roadway in streets where the Council deemed it expedient by reason of the length or importance of the street or by reason of such street forming or being likely to form an important line of communication.

Clause 32 provided power for the Council to construct any street which was deemed expedient either as a continuation of an existing street or to afford communication between existing streets.

These clauses were dropped at second reading in the House of Commons, in order to allow the part of the Bill dealing with means of escape in case of fire to be proceeded with.

It may be observed that the Commissioners adopted the conclusion of the Advisory Board of Engineers that new or widened streets should be laid out to the following standard of widths, no street to be less than 40 ft. wide :—

Main avenues	140 ft.
First class arterial streets	100 „
Second class streets	80 „
Third class streets...	60 „
Fourth class streets	40–50 „

In this connection attention is invited to the Barrow-in-Furness Corporation Act, 1875, by which the Corporation may require any new street which in their opinion will be a main thoroughfare to be 80 ft. in width. The Liverpool Corporation have also promoted a Bill in the present session of Parliament to obtain similar powers.

With regard to the height of buildings, no building may now be erected to a greater height than 80 ft. with two storeys in the roof, except with the consent of the Council, and in the case of streets formed since 1862 and of a less width than 50 ft., no new building may, without the consent of the Council, be erected so that its height exceeds the distance of the front wall from the opposite side of the street.

The Advisory Board of Engineers were of opinion that the London Building Act is over-restrictive in this respect and that the height of buildings should be proportionate to the width of the street, but it is very doubtful whether any change in the existing law in order to permit buildings higher than 80 ft. with two storeys in the roof is desirable.

Street widenings obtained under the London Building Act.

In the exercise of the powers conferred by the London Building Act, the Council has been able to secure considerable widening in existing streets by requiring, in return for a concession allowed under the Act, that land shall be added to the public way. Such widenings are, however, necessarily quite haphazard in character.

Building by-laws.

The Commission recommended that building laws and by-laws in Greater London outside the administrative county should, as far as practicable, be made uniform; that power to define frontages be given to all local authorities; and that new streets should not be taken over by local authorities until sufficient provision has been made for main roads. In the case of roads that have not yet become streets, a sufficient width free of building should be reserved to provide for future requirements. Special provision will be required to meet cases where an undue proportion of the land devoted to building would be necessary for the construction or improvement of main roads. In such cases a fixed percentage of land proposed to be built on might be set aside for new streets without payment of compensation, additional land, if required, being paid for at its market value.

MR. W. E. RILEY.
Superintending Architect, L.C.C.

Same provisions to be applied to undeveloped parts of county.

The Commission further recommended that the same provisions might, with advantage, be applied to building operations on land still unoccupied and situated within the County of London.

Town planning.

The Commissioners also refer to the fact that building is continually going on in the suburbs, and that no time should be lost in arranging that all new streets shall be laid out in accordance with a proper plan and that they shall be of sufficient width.

No authority now possesses such power in London, and no legislation has yet been introduced to carry out these recommendations of the Commission, but attention should be called to the Bill to deal with town planning and development which has been announced by the President of the Local Government Board.

The Bill will probably relate only to areas now undeveloped and would, it is anticipated, enable local authorities to prepare plans which must be adhered to in laying out building estates. Such plans would provide for the width and direction of streets and for the convenient and healthy planning of areas about to be developed.

The Liverpool Corporation (Streets and Buildings) Bill of the present session would enable the Corporation to require the submission of plans showing the proposed development of a building estate, and in order to secure the proper laying out of an estate in respect of which application is made, to require owners to adjust the boundaries of adjoining estates. The Corporation would also be empowered for the purpose of securing the better development of any estate to purchase land and form streets, the expenses of such purchase of land and formation of streets being apportioned on the owner of the land fronting or abutting on such street when building operations are commenced by such owner.

The Association of Municipal Corporations have also laid before the President of the Local Government Board a scheme for a Town Planning Bill. This scheme was adopted after consideration by a Committee consisting of representatives of Birmingham, Manchester, Liverpool, Newcastle, Sheffield, Nottingham, Bristol, Leicester, Leeds, Wolverhampton, Bournemouth, Brighton, Plymouth, Harrogate and Woolwich.

Briefly, the scheme recommended by the association provides for extensive powers to be conferred on local authorities to control the laying out, width, and direction of streets in connection with building schemes or otherwise; as to the number of houses per acre which may be erected; as to the purchase of land by local authorities for the convenient development of their districts, and as to the administration of the Act.

The practice in Germany is for official town plans to be prepared for so large an area that the needs of the near future are provided for, usually for a period of 25 years. Generally only the principal streets are fully decided on, an indication being given of the mode of division of the land into sites, the details being left to the time of future development. The draft of the plan has to be shown in public for one month, and objections are heard by an administrative tribunal. The town-plan also lays down building lines and street lines for the existing parts of the town. Building by-laws are made in agreement with the town plan, as regards the space about buildings and as to the classes of buildings. Legal powers are granted to towns for carrying out the building plans, and towns acquire a direct influence by extensive purchases of land within the limits of the plan.

I am obtaining fuller information on the subject of town planning in Germany, and with the authority of the Committee I propose to transmit this to Sir H. Jekyll when received.

General.

The proposals contained in two Bills promoted in the present session of Parliament for the acquisition of property and the construction of motor roads from Glenthorne Road, Hammersmith, to Windsor, and from Wood Lane, Hammersmith, through the counties of Middlesex and Buckingham, will doubtless be considered by the Traffic Department of the Board of Trade in relation to the general problem of traffic. If successful, the motor roads might have the effect of relieving the main roads of some of the motor traffic, but the proposals are of such an experimental character that it is difficult to pronounce a definite opinion upon them. It may be urged that they should not be allowed to be constructed except in relation to a general comprehensive scheme.

The apparent improbability of further extensions or widenings of trunk railways or the construction of new tube railways in London adds greater importance to the conclusions of the Commission with regard to streets. The completion of the Great Northern, Piccadilly and Brompton, the Baker Street and Waterloo, and the Charing Cross, Euston and Hampstead tube railways, with the introduction of connections with other systems has considerably increased travelling facilities, but the urgency of the street problem remains. The traffic services of London have grown into the present chaotic condition by the want of control at the initial stages. Repeated efforts have been made at enormous expense to correct the original mistakes, but no unified scheme has been brought forward, since the plan prepared by Sir Christopher Wren after the Great Fire, to deal with the problem.

The Town Planning Bill is probably the most important step which has been taken hitherto to meet this difficulty.

To put the question on a proper footing, a carefully considered and comprehensive scheme is required, dealing not only with the surface in a generous and far-sighted manner, but by combining in a well thought-out plan all systems of communication.

W. E. RILEY,
Superintending Architect.

28th January, 1908.

APPENDIX C.—VIII.

Supplementary Statement to the evidence given before the Royal Commission on London Traffic by the Valuer of the London County Council.

Royal Commission on London Traffic, Vol. III., Appendix No. 12, pp. 315-321.

MR. A. YOUNG, Valuer, L.C.C.

Referring to the order of the Committee of the 16th ult., I have perused the Minutes of the Proceedings of the evidence given by me before the Royal Commission with the view of considering whether there is any information supplemental to that given to the Commission which could now be submitted to the Board of Trade, as requested in their letter of the 25th November last.

I have not considered whether there are any branches of information other than those that were tendered to the Commission, but, in one or two instances, the information then given might usefully be brought up to date. Dealing with these points in the order in which they appear in the proof of my evidence, they are as follow :—

1. *Ownership of property in the County.*

Whilst the figures as to the large estates remain as before, the total area covered up to the present is nearly 111 square miles, or 97 per cent. of the total area of the County, and the number of owners registered now extends, for this area, to 26,400.

2. *With regard to betterment.*

At the time the evidence was given there had been no case where the time had arrived for the assessment of the betterment. Since that date, however, there have been two improvements where betterment has been assessed, *i.e.*, Tottenham Court Road and Tower Bridge Southern Approach. The Arbitrator finally determined, in the case of the Tottenham Court Road, that the properties included in the assessment area should pay a total of £285 10*s.* per annum, and in the case of the Tower Bridge Southern Approach, a sum of £358 16*s.* per annum. In the latter case the payment of £246 6*s.* per annum is suspended until the happening of certain events, but the whole amount will ultimately be payable to the Council. As the owners can redeem at 33 years' purchase, these figures represent an equivalent of £9,421 10*s.* and £11,840 8*s.* respectively.

In addition, attention may be drawn to a case in the neighbourhood of the Tottenham Court Road improvement, which was not included in the betterment area. A plot of land on the eastern side, having frontages to Tottenham Court Road, Bedford Avenue, and Caroline Street, was leased, about the time the improvement was being carried out in 1900, by the Duke of Bedford, at a rental of £2,600 per annum, which was based on 2*s.* 6*d.* per foot super. Just recently the property has been disposed of to the Young Men's Christian Association on the basis of 6*s.* per foot super. per annum. In an action for commission in the King's Bench Division recently tried, it was stated in the evidence by the owners that this considerable increase in value was due to the improvements at the southern end of Tottenham Court Road being carried out, referring to the removal of the Boziers Court block of buildings.

ANDREW YOUNG,
Valuer.

January, 1908.

APPENDIX C.—IX.

MR. G. L. GOMME.

Statement on By-laws.

LONDON COUNTY COUNCIL.

By-laws for the good rule and government of the County of London and the recommendations of the Royal Commission on London Traffic bearing on the subject.

STATEMENT BY THE CLERK OF THE COUNCIL.

21st July, 1908.

NOTE.—Under Section 23 of the Municipal Corporations Act, 1882, as applied to counties by section 16 of the Local Government Act, 1888, the Council has power to make byelaws for the good rule and government of the Administrative County of London, or any specified part or parts thereof, and for the prevention and suppression of nuisances not already punishable in a summary manner by virtue of any Act in force throughout the county, and to appoint such fines, not exceeding in any case five pounds, as it deems necessary for offences against such by-laws. By-laws may not come into force until the expiration of forty days after sealed copies have been sent to the Home Secretary, and copies posted in the County Hall, during which period they may be disallowed by the Crown, or the Crown may extend the time within which the byelaws shall not come into force.

Certain questions have been in abeyance for some time relating to :—

(1) The delivery of barrels and coal by ropes across the footways ;
(2) The regulation of slow-going traffic ;
(3) Stationary vehicles ; and
(4) Brakes on vehicles.

(1) *Delivery of barrels and coals.*

Under a reference made by the Council, consequent upon the report of the Conference on Streets and Street Traffic, the Local Government Committee in 1902 and 1903 considered the question of dealing with the obstruction caused by the loading and unloading of barrels, coal, &c., across the public footways. The Home Secretary, however, stated that a by-law could not be made by the Council under section 23 of the Municipal Corporations Act, 1882, in view of the fact that the matter was already dealt with by section 15 of the Metropolitan Streets Act, 1867, but expressed his willingness to consider proposals for an extension of the "special limits" to which the provisions of the Section apply. The "special limits" comprise such streets and places as may from time to time be so declared by the Commissioners of Metropolitan and City Police within their respective districts with the consent of the Home Secretary. The Committee consulted the metropolitan borough councils on this proposal, but the replies received showed such a diversity of opinion that the Council, on 24th February, 1903, resolved to inform the Home Secretary that, in its opinion, the hours specified in the Act were unsuitable, and that steps should be taken for an amendment of the law. The Home Secretary subsequently intimated that no action would be taken pending the report of the Royal Commission on London Traffic, before whom evidence on the subject was given on behalf of the Council and other authorities.

The Royal Commission reported as follows :—

"The loading and unloading of coal across the footway, and the lowering or drawing up of casks, other than casks containing wine or spirits, by means of ropes, chains, or other machinery passing across the footway within the 'special limits' is prohibited by section 15 of the Metropolitan Streets Act, 1867, within the hours of 10 a.m. and 6 p.m. Para. 164.

"This provision of the law does not work satisfactorily. In many districts the hours within which such articles may be loaded or unloaded are not the hours at which the operation can be carried out with least inconvenience to the public. For example, in some streets there are more foot passengers before 10 a.m. than after that hour, and consequently the loading and unloading has to be done at a time when the maximum of inconvenience is caused thereby. Nor does it seem expedient to restrict the rule on this subject to the area known as the 'special limits.'

"The requirements of the case would be met if the general power to make regulations regarding the standing of vehicles for loading and unloading, which we have recommended to be conferred upon the Commissioners of Police, is extended on the same conditions, so as to enable them to deal with methods and times of loading and unloading. If this general recommendation is not accepted, we recommend that the Corporation of the City of London and the Metropolitan Borough Councils be given power to regulate by by-law the hours at which certain articles may be loaded or unloaded across the pavements in the streets of London. The regulations or

MR. G. L. GOMME. Statement on By-laws.

by-laws proposed should be examined by the Traffic Board before being finally dealt with, in the manner before referred to, by the Secretary of State for the Home Department. The hours need not be the same for all streets, nor need the rules apply to all streets, and coke should be included in the list of such articles as well as coal."

(2) *Slow-going traffic.*

The Roads Improvement Association suggested that the Council should make a by-law, similar to one in force in Nottingham, requiring slow-going traffic to be kept to the sides of the streets The proposal was supported by the Wandsworth Borough Council. The Local Government Committee of the Council consulted the Home Secretary, who stated that he was of opinion that a by-law might properly be made by the Council under Section 16 of the Local Government Act, 1888, but that following precedents set by Parliament, the by-laws should not be applied generally, but should be limited to specified streets which are liable to be obstructed by reason of the nature and amount of the traffic, the scope of the by-law being extended if experience justified that course. The terms in which the Home Secretary suggested that the by-laws might be made were as follows :—

"Every person driving or being in charge of any vehicle which is moving at a "walking (slow) pace in any street or part of a street declared to be special limits under "the Metropolitan Streets Act, 1867, shall, as far as practicable, keep the same on the left "or near side of the street and close to the kerb of the footway."

The Home Secretary, however, ultimately agreed with the view of this Committee, that to apply the by-law to the streets included in the "special limits" fixed under the Metropolitan Streets Act, 1867, as he had at first suggested, was open to objection, but as he was indisposed to allow a general by-law which the Committee favoured, the Committee asked to be furnished with a list of main thoroughfares in the County, which, in the opinion of the Commissioner of Police, should come within the scope of the by-law, such list to include all streets in which a tramway runs. In deference to the views of the Home Secretary, it was subsequently decided not to proceed further with the proposal pending the report of the Royal Commission on Traffic.

The Royal Commission reported as follows :—

Para. 189. "We are also of opinion that all vehicles proceeding at a slow or walking pace should, in the absence of reasonable grounds to the contrary, be required to keep as close as practicable to the kerb. If the rule of keeping the slow traffic to the kerb could be generally enforced, it would materially relieve congestion in the streets, by tending to separate the slow and fast traffic, but, owing to the number of vehicles standing at the sides of the streets, it cannot be strictly enforced, and the satisfactory working of the rule will depend on the discretion exercised by the police in enforcing it. We were informed . . . . . that this rule is already enforced with great advantage by the City Police where practicable, and that this is done under the authority given by the City of London Police Act, 1839, section 35, sub-section (6). On the other hand Sir Alexander Bruce, Assistant Commissioner of Metropolitan Police, has stated that the Metropolitan Police have practically no power to compel heavy traffic to keep to any part of the road.

"We observe, however, that the powers conferred on the Metropolitan Police by section 54, sub-section (6) of the Metropolitan Police Act, 1839, are in terms precisely the same as those possessed by the City Police under the City of London Police Act, 1839, and that two notices have been issued and published by the Commissioner of Police of the Metropolis, dated August, 1898, and 19th March, 1901, respectively, stating that instructions had been given to the police to direct all carmen and drivers of heavy vehicles to keep to the near side as much as possible, and all carmen and drivers of vehicles moving at a slow or walking pace to keep as close as possible to the kerb on the near side. It appears probable that the Commissioner of Metropolitan Police apprehended that a conviction for disobedience of these orders could not be obtained before a Metropolitan magistrate.

"We also understand that the question of a by-law dealing with this subject, made by the London County Council, is under consideration by the Secretary of State for the Home Department. We have already said that we think a rule of this nature is expedient"

Sir George Bartley, one of the Commissioners, did not agree with the above views, for in the separate report which he made, occurs the following paragraph :—

"I cannot think that in our present crowded streets it is possible practically to enforce a rule that the slow traffic shall keep along the kerb. No doubt it would be desirable. As, however, in every few yards a vehicle is often standing at a place of business, such a rule, if enforced, would in many trading streets involve the slow and heavy traffic continually going in and out many times in each street, and require the horses to drag the heavy carts and vans up and down the slope of the road, which is often considerable. In the broad roads and new avenues it seems to me that heavy traffic might be confined to the second row to great advantage."

It is possible that the Committee may again approach the Home Secretary in the matter. It will be observed that the Royal Commission apparently contemplate a general by-law as suggested by this Committee, whereas the late Home Secretary considered that the by-law must be limited to specified streets.

(3) *Stationary Vehicles, &c.*

In connection with the general question of street traffic the Royal Commission referred to the great hindrance to locomotion caused by the standing of waggons, vans, and other vehicles at the sides of the streets for loading and unloading. The Metropolitan Police

Act, 1839, section 54 (6) provides for the infliction of a penalty on "every person who shall cause any cart, public carriage, sledge, truck or barrow, with or without horses, to stand longer than may be necessary for loading or unloading, or for taking up or setting down passengers . . . . or who by means or any cart, carriage, sledge, truck or barrow, or any horse or other animal, shall wilfully interrupt any public crossing, or wilfully cause any obstruction in any thoroughfare."

The Commissioners state :—

Para. 161. "It is obviously out of the question to attempt to prohibit the practice of the standing of vehicles at the sides of the streets, either universally or in particular streets. On the other hand, the standing of vehicles, for this purpose, in crowded and often narrow streets, either continuously or with only short intervals, seriously impedes locomotion. If there is any doubt about the law, it should be made clear that the use of the streets by frontagers shall only be such as is reasonable, having regard to the convenient use of the streets for general purposes; for example, where a business is of such a nature that the owner practically converts the street opposite his place of business into a private yard, to the serious inconvenience of the general public, we think he might not unreasonably be required to provide a suitable place for loading and unloading; in regard in future buildings this should be made compulsory.

Para. 162. "As regards exisiting buildings we are disposed to think that it would be well to give power to some authority to make by-laws or regulations as to the standing of vehicles at the sides of the streets for loading or unloading or other purposes. It might, for example, be found expedient to prohibit the loading or unloading of vehicles, or of certain classes of vehicles, at particular times in specified streets."

The Commissioners experienced some difficulty in deciding upon the authority to whom such powers should be given, but they state that, on full consideration of the question, they are of opinion that the best course would be to give the Commissioner of the Metropolitan Police (with the approval of the Home Secretary), and to the Commissioner of the City Police (with the approval of the Court of Mayor and Aldermen), and subject to the approval of the Home Secretary, power to make regulations, such regulations in common with all other by-laws or regulations relating to traffic to be examined by the new Traffic Board proposed to be created, which, after conferring with the local and street authorities, would submit recommendations to the Home Secretary. The Board would also report to the Home Secretary upon recommendations affecting street traffic from street and local authorities.

The Commissioners express the opinion that if powers of making byelaws in the matter were given to the metropolitan borough councils there would be a danger that the rules for adjoining districts would conflict, and that on the other hand, if such powers were given to the Council, the Council might find it impossible to meet the requirements of the metropolitan borough councils, with the result that there would be friction and local opposition.

Para. 163. The Commissioners, however, draw attention to the existing powers of the Council and the metropolitan borough councils to make by-laws for good rule and government of the areas under their respective jurisdiction; and suggest that this power might be held to enable those authorities to make by-laws regulating the standing of vehicles at the sides of the streets.

Para. 165. As regards the waiting of carriages and other vehicles to take up passengers, or for other purposes which it would be difficult to deal with by by-laws or regulations, the Commissioners recommend that statutory provision should be made empowering the police to require, for reasonable cause, persons in charge of vehicles or horses to remove them from the vicinity, or to some adjacent portion of the same street, or to some neighbouring street indicated by the police.

Para. 180. The Commssioners also recommend that power should be given to the Council and the City Corporation to regulate and prohibit by by-laws the use of streets by costermongers or itinerant vendors, such by-laws to be reported upon by the new Traffic Board and approved by the Home Secretary, who should be empowered to sanction the by-laws either absolutely or conditionally.

(3) *Brakes on vehicles.*

In 1903 the Local Government Committee considered the question of the Council making a by-law requiring four-wheeled vans to be fitted with brakes. Before coming to a decision on the question whether the Council should make a by-law on the subject under section 23 of the Municipal Corporations Act, 1882, the Committee felt it would be an advantage to learn whether the experience of the London police pointed to the desirability of such a by-law. They accordingly wrote to the Commissioner of City Police and also to the Home Secretary, but subsequently it was thought inexpedient to proceed further at that stage with the proposal with respect to brakes until experience had been gained of the working of the other by-law as to covered vans.

The question was also raised by a deputation from the Trades Union Congress Parliamentary Committee, who recently waited upon the Home Secretary, and asked, *inter alia*, that some regulation should be made "as a safeguard against accidents to carmen and carters and the public in general, and also as a further means of prevention of cruelty to horses."

The subject is not referred to in the report of the Traffic Commission, but it will probably engage the attention of the Council at an early date.

G. L. GOMME,
Clerk of the Council.

COUNTY OF LONDON.

By-laws made by L.C.C.

By-laws made by the London County Council in pursuance of the provisions of Section 23 of the Municipal Corporations Act, 1882, and Section 16 of the Local Government Act, 1888, for the Good Rule and Government of the Administrative County of London.

BY-LAWS MADE ON 19TH JULY, 1898.

Steam Organs, Shooting Galleries, Roundabouts, &c.

No person shall in any street or on any land adjoining or near thereto use or play, or cause to be used or played, any steam organ or other musical instrument worked by mechanical means to the annoyance or disturbance of residents or passengers.

No person shall in any street or on any land adjoining or near thereto keep or manage, or cause to be kept or managed, a shooting gallery, swing boat, roundabout, or any other construction of a like character, so as to cause obstruction or danger to the traffic of any such street.

Noisy Animals.

No person shall keep within any house, building, or premises any noisy animal which shall be or cause a serious nuisance to residents in the neighbourhood. Provided that no proceedings shall be taken against any person for an offence against this by-law until after the expiration of a fortnight from the date of the service on such person of a notice alleging a nuisance, signed by not less than three householders residing within hearing of the animal.

Street Betting.

No person shall frequent and use any street or other public place, on behalf either of himself or of any other person, for the purpose of bookmaking or betting, or wagering, or agreeing to bet or wager, with any person, or paying, or receiving, or settling bets. [*See further by-law made by the Council on* 21*st January* 1902.]

Penalty.

Any person who shall offend against any of the foregoing by-laws shall be liable for every such offence to a fine not exceeding forty shillings, except in the case of the by-law relating to street betting, the fine for the breach of which shall be an amount not exceeding five pounds.

BY-LAW MADE ON 6TH FEBRUARY, 1900.

Street Shouting.

No person shall, for the purpose of hawking, selling, or advertising any newspaper, call or shout in any street so as to cause annoyance to the inhabitants of the neighbourhood.

Penalty.

Any person who shall offend against the foregoing by-law shall be liable for every such offence to a fine not exceeding forty shillings.

BY-LAWS MADE ON 20TH MARCH, 1900.

Flash and Search Lights.

No person shall exhibit any flash light so as to be visible from any street and to cause danger to traffic therein, nor shall any owner or occupier of premises permit or suffer any flash light to be so exhibited on such premises.

The expression "flash light" means and includes any light used for the purpose of illuminating, lighting, or exhibiting any word, letter, model, sign, device or representation in the nature of an advertisement, announcement, or direction, which alters suddenly either in intensity, colour, or direction.

No person shall exhibit any search light so as to be visible from any street and to cause danger to the traffic therein, nor shall any owner or occupier of premises permit or suffer any search light to be so exhibited on such premises.

The expression "search light" means and includes any light exceeding 500-candle power, whether in one lamp or lantern or in a series of lamps or lanterns used together and projected as one concentrated light, and which alters either in intensity, colour, or direction.

In these by-laws the expression "street" includes any highway and any road, bridge, lane, mews, footway, square, court, alley, passage, whether a thoroughfare or not, and a part of any such highway, road, bridge, lane, mews, footway, square, court, alley or passage.

Any person who shall offend against any of the foregoing by-laws shall be liable for every such offence to a fine not exceeding five pounds.

Public Decency.

By-laws made by L.C.C.

Every person who in any street or in any open space to which the public have access for the time being, shall commit or attempt to commit any act of indecency with any other person or shall to the annoyance of residents or passengers commit any act of indecency which is not already punishable in a summary manner by virtue of any Act of Parliament in force throughout the County of London, shall be liable to a fine not exceeding five pounds.

BY-LAW MADE ON 21ST JANUARY, 1902.

Street Betting.

No person shall frequent and use any street or other public place on behalf either of himself or of any other person for the purpose of offering for sale, selling, or distributing any paper or written or printed matter devoted wholly or mainly to giving information as to the probable result of any race, steeplechase, or other competition.

Any person who shall offend against the above by-law shall be liable for every offence to a fine not exceeding five pounds.

BY-LAWS MADE ON 12TH MAY, 1903.

Window Cleaning, Painting, &c.

Every person who in any street, to the obstruction, annoyance, or danger of residents or passengers, orders or permits any person in his service to stand or kneel on the sill of any window for the purpose of cleaning or painting such window, or for any other purpose whatsoever, such sill being more than six feet in height from the level of the ground immediately below it, without support sufficient to prevent such person from falling, shall for every such offence forfeit and pay a sum not exceeding five pounds.

Every person who in any street, to the obstruction, annoyance, or danger of residents or passengers, stands or kneels on the sill of any window for the purpose of cleaning or painting such window, or for any other purpose whatsoever, such sill being more than six feet in height from the level of the ground immediately below it, without support sufficient to prevent such person from falling, shall for every such offence forfeit and pay a sum not exceeding twenty shillings.

Spitting.

No person shall spit on the floor, side, or wall of any public carriage, or of any public hall, public waiting room, or place of public entertainment, whether admission thereto be obtained upon payment or not.

Any person who shall offend against this by-law shall be liable for each offence to a fine not exceeding forty shillings.

BY-LAW MADE ON 15TH DECEMBER, 1903.

Vehicular Traffic.

No owner of a vehicle shall drive such vehicle or permit the same to be driven or to be upon any highway unless it be so constructed that the driver thereof shall have a full and uninterrupted view of the traffic on such highway in front and abreast of him on each side, and no person who shall be driving any vehicle upon any highway shall occupy such a position as will prevent or interfere with his having such full and uninterrupted view as aforesaid.

Any person who shall offend against this by-law shall be liable for each offence to a penalty not exceeding forty shillings.

BY-LAWS MADE ON 29TH MAY, 1906.

Waste paper, refuse, advertising bills, fruit rinds, broken glass, &c.

No person shall (1) sweep or otherwise remove from any shop, house, or vehicle into any street any waste-paper, shavings or other refuse, or being a costermonger, newsvendor or other street trader, thrown down and leave in any street any waste paper, shavings, or other refuse; (2) throw down and leave in any street, for the purpose of advertising, any bill, placard, or other substance; (3) throw down and leave in any street any bill, placard or other paper which shall have been torn off or removed from any bill-posting station.

No person shall deposit in any street or public place to the danger of any passenger, the rind of any orange, banana or other fruit, or the leaves or refuse of any vegetable.

No person shall throw, place or leave any bottle or any broken glass, nail or other sharp substance (not being road material) on or in any street or public place in such a position as to be likely to cause injury to passengers or animals or damage to property.

In these byelaws the expression "street" includes any highway, and any road, bridge, lane, path, footway, mews, square, court, alley or passage to which the public have access for the time being.

Any person who shall offend against any of these by-laws shall be liable for each offence to a fine not exceeding forty shillings.

By-laws made by L.C.C.

The by-laws made by the Council on 12th May, 1903, relative to the throwing down in streets of waste paper, refuse, advertising bills, broken glass, &c., are repealed as from the date on which the above by-laws came into force.

G. L. GOMME,
Clerk of the London County Council.

Spring Gardens, S.W.,
October, 1906.

Obstructions on Tramway Tracks.

Extract from the Minutes of the Council of 23rd June, 1908.

REPORT OF THE HIGHWAYS COMMITTEE.

Obstructions caused by the breakdown of vehicles on the tramway tracks.

5.—For some time past we have had under consideration the question of the legal position with regard to obstructions to tramway traffic caused by the breakdown of vehicles on the lines. Cars are frequently held up for a considerable time owing to the fact that vehicles, which have broken down, are not removed within a reasonable period, and not only is the tramway service seriously dislocated thereby, but great, and, we think, avoidable inconvenience to the public results. We are of opinion that the Council should obtain parliamentary authority to enable it to deal with obstructions of this nature. The solicitor has advised, under Standing Order No. B 163, that the Council has power to promote legislation on the subject, and we recommend—

That application be made in the session of Parliament of 1909 for authority to enable the Council to deal with obstructions caused by the breakdown of vehicles on tramway tracks. [*Agreed.*

APPENDIX D.

H.M. COMMRS. OF WOODS AND FORESTS.

London Street Improvements.

I. London Street Improvements carried out at the expense of Public Funds by the Commissioners of Woods and Forests.

II. London Street Improvements effected at the cost of Crown Lands or of Parliamentary Funds, &c., by the Commissioners of Works.

APPENDIX D.—I.

London Street Improvements carried out at expense of Public Funds through the Commissioners of Woods, &c.

1.—REGENT STREET FROM PORTLAND PLACE TO PALL MALL.

This street was formed under the Powers of the New Street Act, 1813 (53 Geo. III. c. 121). It was completed in 1826, and the cost, including the new sewer, amounted to £1,533,582. This cost is stated in the fifth report of the Commissioners of Woods, &c. (1826), but appears to be only the amount of monies actually expended in purchasing properties or interests therein and making the street and sewer, and does not apparently include anything for the freehold interest of the Crown in a considerable amount of property which then belonged to the Crown and was used in forming the street, though it did include payments for leasehold and trade interests existing in that property.

The frontages along the street, including both purchased and old land revenue property, were retained by the Crown (except in one or two instances where grants were made) and belong to the Crown now. The frontages that were granted have since been re-purchased on behalf of the Crown.

About the time that this street was being formed the Crown Estate in and around and on the east side of the Regent's Park was being laid out for building, and on this various streets, now public, were formed, such as Park Crescent, Albany Street, Osnaburgh Street (and several other cross streets connecting the two last mentioned), and Augustus Street, besides parts of the Marylebone Road, &c.

Various other minor street improvements were also carried out, such as the extension of Charles Street through to the Haymarket, the formation of Whitehall Place down to the river (*i.e.*, before the Thames Embankment was constructed), the widening of Tichborne Street (now disappeared and absorbed in Piccadilly Circus), for which Crown property was used, but the cost of these several minor works cannot be stated.

2.—STREET IMPROVEMENTS UNDER THE ACT OF 1813 EXTENDED BY THE ACT 7 GEO. IV. C. 77 (1826).

These comprised the Charing Cross and Strand Improvements, viz., formation of Trafalgar Square, extension of Pall Mall, widenings of the Strand, and the formation of King William, Adelaide, and Duncannon Streets, &c.

Also street improvements at Downing Street, King Street, Bedford Street, York Street, Tavistock Street, and Piccadilly.

The expenditure in respect of these several street improvements appears to have been £1,204,882 (*see* Commissioners of Woods Report for 1849, p. 89), exclusive, presumably, of Crown property utilised, of which the principal was the King's Mews situate on part of the site of Trafalgar Square and the National Gallery.

3.—STREET IMPROVEMENTS UNDER THE ACTS 3 AND 4 VIC. C. 87 AND 4 VIC. C. 12, EXECUTED BETWEEN 1840 AND 1847.

These comprised the formation of New Oxford Street between Tottenham Court Road and High Holborn; Cranbourne Street between Coventry Street and Long Acre; extension of Long Acre to Charlotte Street; streets from the London Docks to Spitalfields Church, and from East Smithfield to Rosemary Lane.

The cost of these cannot be accurately stated, as after 31st March, 1851, any expenditure would have been made by the Commissioners of Works, that Department being separated in that year from the Woods and Forests Department.

H.M. Commrs. of Woods and Forests.

Up to 31st March, 1851, the expenditure appears to have been about £994,300, and practically the expenditure was probably closed by then.

London Street Improvements.

4.—Under the Act 9 and 10 Vic. c. 34.

A new street from Spitalfields to Shoreditch. The penultimate remark under head 3 applies here also, and the expenditure up to 31st March, 1851, appears to have been about £100,976.

Office of Woods, &c.
March, 1908.

H.M. Office of Works.

London Street Improvements.

APPENDIX D.—II.

London Street Improvements effected at the Cost of Crown Lands or of Parliamentary Funds, or by Sales, or Give and Take Arrangements, &c.

Date of Authority for, or of Execution.		
		Hyde Park.
1842	Knightsbridge	Under the provisions of the Act 5 & 6 Vic. cap. 19 the Albert Gate Entrance to *Hyde Park* was formed, certain houses being demolished for the purpose.
1866	Park Lane	A strip of land, part of *Hyde Park*, varying in width from 10 feet to 18 feet, along the whole length of Park Lane, was appropriated for the widening, which was completed in 1869.
1869	Hamilton Place	Hamilton Place widened and extended into Park Lane, part of *Hyde Park* and *Hamilton Place Garden* being taken for the purpose (Park Lane Improvement Act, 1869, 32 & 33 Vic. cap. 134).
1869	Oxford Street and Bayswater Road.	Part of *Hyde Park* of an average width of 6 feet over a length of 600 feet westwards from the Marble Arch appropriated for this improvement.
1879	Knightsbridge	A strip of land adjoining Knightsbridge barracks was taken for the widening of the Knightsbridge Road (42 & 43 Vic. cap. 219).
1908	Marble Arch Improvement...	The isolation of the Marble Arch to enable the street traffic to be carried to the south thereof involved the surrender of a piece of *Hyde Park* averaging 400 feet by 145 feet. The Commissioners of H.M. Works bore the cost of the rearrangement of the roads, paths, &c., within the Park. The Arch remains in the charge of the Commissioners, as will the trees to be planted on the islands at the side thereof. The London County Council will maintain the new roadways.
		Green Park and St. James's Park.
1844	Piccadilly	The Commissioners of Woods and Works were authorised by the Act 7 & 8 Vic. cap. 88 to widen Piccadilly between Bolton Street and Park Lane, taking so much of the *Green Park* as was necessary to make the street of a uniform width of 70 feet or thereabouts.
1852–53	Buckingham Gate	Improvements effected in the neighbourhood of Buckingham Palace, a new road being formed, Victoria Road (now Buckingham Palace Road) improved, &c. (15 & 16 Vic. cap. 78 and 16 and 17 Vic. cap. 44).
1882	Hyde Park Corner	Part of the *Green Park* and of the *Garden of Buckingham Palace* appropriated for roadways, the Wellington Arch being removed to its present position. The dimensions of the irregular triangle of park land given up were 550 feet by 550 feet by about 750 feet measured round the curve.
1901	Piccadilly	A portion of the *Green Park* (of a width of 50 feet at the widest point) given up for widening of Piccadilly between the Wellington Arch and Down Street.
1906	Piccadilly	The railing of the Geological Museum which projected into Piccadilly set back to relieve the congestion of foot traffic at that point.
		Westminster.
1859–60	Westminster	In connection with the construction of Westminster Bridge, considerable additions were made to the roadways of Parliament Street, Bridge Street, and New Palace Yard for approaches to the Bridge. The north boundary of New Palace Yard altered to its present line (16 & 17 Vic. cap. 49 and 22 & 23 Vic. cap. 50).
1865	Whitehall	An island block which lay in front of the present Home Office block (Downing Street to Charles Street) removed, a large part of the site thereof being devoted to street improvements (28 Vic. cap. 31). (The block in question is shown on plan with Parliamentary Paper 186 of 1864.)

H.M. Office of Works.

London Street Improvements.

Date of Authority for, or of Execution.		
		WESTMINSTER—*continued.*
1896	Parliament Street	A very considerable widening of Parliament Street to line generally with Whitehall was carried out by the Commissioners of Works as well as the widening of Charles Street and Great George Street, at the cost of lands acquired for the public service under the New Public Offices (Westminster) site Act 59 & 60 Vic. cap. 23 and previous Acts.
1897	Whitehall	In connection with the erection of the New War Office (60 & 61 Vic. cap. 27) widenings of Whitehall Place and Horse Guards Avenue were effected.
1867	Abingdon Street	The southern part of Abingdon Street was widened in connection with the acquisition of lands south of the Houses of Parliament, construction of Embankment and laying out of Public Garden authorised by Act 30 & 31 Vic. cap. 40.
1900	Abingdon Street	Under the provisions of the London County Council (Improvements) Act, 1900 (63 & 64 Vic. cap. ccixix.), a new street will be formed consisting in part of the widening of Abingdon Street. The scheme involves the throwing into the new street of parts of the Victoria Tower Garden and the store yard and portions of certain houses on the west side of Abingdon Street.
—	Westminster (Princes Street)	Consequent upon the exchange of a site on the south side of Great George Street, Westminster, for the site of the Institution of Civil Engineers on the north side of that street a widening of Princes Street will be effected to the extent of 15 feet for a length of about 182 feet from Great George Street end (Public Offices Site (Extension) Bill, 1908).
1877	St. Martin's Place, W.C. ...	Property on the west side of St. Martin's Place was sold to the Metropolitan Board of Works under the provisions of the Act 40 & 41 Vic. cap. ccxxxv., also a strip of land at the south-east corner of the National Gallery. The purchase was completed in 1885.
1887	St. Martin's Place, W.C. ...	By mutual agreement between the Commissioners of His Majesty's Works and the Metropolitan Board of Works a give and take line was arranged on the west side of St. Martin's Place.
—	—	Although not strictly speaking street improvements, the Mall improvement (begun 1904), the formation of crescent roads round the site of the Queen Victoria Memorial, alterations at the end of Bird Cage Walk and entrance to Buckingham Gate, the formation of the Broad Walk to Piccadilly, and the widening in 1907 of Constitution Hill to 50 feet, with additions to the paths, all tend to facilitate the progress of traffic in the surrounding neighbourhoods.
		THE STRAND, &c.
1872	Clement's Inn Passage ...	Under the terms of a mutual Conveyance of land between Clement's Inn and the Commissioners of Works (2nd November, 1872) this widened roadway from the Strand was formed; the Commissioners bearing the cost of making it. An old road which lay to the east was closed.
1889	Clement's Inn	Under the provisions of the Act 50 & 51 Vic. cap. clxxxvii. (Bankruptcy Offices Site Act) the Commissioners of Works provided, in lieu of Grange Court, a widened foot-passage in front of the Bankruptcy Buildings leading to Clement's Inn on the north; and under an Agreement (16th December, 1889) with the owner of Clement's Inn a right of way through Clement's Inn is reserved to the Commissioners of Works for all persons on week-days (except Good Friday) between 8 a.m. and 7 p.m.
1882	Strand and Carey Street ...	Considerable additions were made to the footpaths in the Strand and Carey Street from lands acquired for the Royal Courts of Justice Site (28 Vic. cap. 49 and 34 & 35 Vic. cap. 57).
1897	Tower Hill	An improvement of the approach to the Tower Bridge was made through an exchange of land at the Royal Mint between the London County Council and the Commissioners of His Majesty's Works (60 & 61 Vic. cap. ccxlii., London County Council Improvements Act, 1897).

H.M. Office of Works,
Westminster, S.W.,
June, 1908.

Mr. W. H. Dawson.

German Towns.

APPENDIX E.

I. Memorandum on German Municipal Government with special reference to town extensions.

II. The Government and Extension of Washington, U.S.A.

APPENDIX E.—I.

Memorandum on German Municipal Government, with special reference to Town Extensions.

The first characteristics of German municipal government which strike an investigator's attention are the wide powers conferred upon local government bodies in certain directions, and the facility with which these powers can be extended, and adjusted to changing conditions. On the other hand, municipal jurisdiction is restricted in other directions owing to the large powers possessed by the Police Authority. In Germany the Police Authority resides in the State, though the State may, and in most cases does, constitute the mayor of a town its deputy, in which case the police organisation is subject to his direction. In the large towns, however, the Police Authority is sometimes entirely independent of the municipal bodies; Berlin is a case in point.

This reservation by the State for independent exercise of police functions is the more important because the functions themselves are very extensive. Among the functions discharged in some States by the police over and above those connected with the protection of public order and security in the narrow sense, are the control of buildings, the passing of plans, the administration of the laws and regulations affecting the sale of food, the regulation of lodging-houses, public and private, &c. Here the municipal authorities are constantly seeking to enlarge their jurisdiction, though without great success.

I.—THE ORGANS OF COMMUNAL GOVERNMENT.*

Not only in powers, however, but in constitution also the German system of communal government differs greatly from the English. There is here considerable variety in detail between one State and another, yet the main features are everywhere the same. The communal authority is composed of three co-ordinate factors:—

(*a*) The Mayor (*Bürgermeister*) or Chief Mayor,
(*b*) The Executive, and
(*c*) The Communal Council.

Although the mode of election is different, the Communal Council is, in the main, constituted of much the same material as the English Town Council. The method of election is that known as the "three-class system." The whole of the voters are entered upon an electoral register in the order of the direct taxes they pay; the aggregate amount of these taxes is then divided into three, and each of the groups of taxpayers so obtained returns one-third of the members, with the proviso, however, that a certain proportion of the members must be house owners.

On the other hand, the mayor and executive have no exact counterpart in this country. The Communal Council elects its own president, or chairman, who is not the mayor.

The Mayor (or Chief Mayor as he is, by Royal permission, called in large towns, in which case he has a deputy called the mayor) is a paid official, and his position is a professional one, requiring in its occupant special training, not only in law, but in the various sciences that bear on local government, *e.g.*, finance, economics, &c. He discharges many of the functions of the English town clerk, but his power is greater, his responsibility wider, his status higher, though his remuneration is (comparing towns of similar size) almost invariably less—in the largest towns it ranges from £750 to £1,500. It is his duty to direct the entire work of municipal administration, and all responsibility is primarily his, though he deputes to the members of the executive their several departments of work. A mayor is elected by the Communal Council for a term of years, as a rule twelve, but the appointment is subject to confirmation by the Government; in Berlin by the Crown.

The executive (generally called "Magistrat"† or "Stadtrath" in Prussia) consists of the Mayor or Chief Mayor and his deputy and a variable number of nominated members; in large towns about twenty are usual, some being unpaid (and being the nearest German equivalent to our aldermen), but the majority invariably paid. The paid members of the executive are permanent heads of departments, whose business it is to administer all Imperial and State laws and regulations incumbent upon a municipality, to execute in proper form resolutions passed by the Communal Council, to

* The word "communal" is used in preference to "municipal," since there is no exact correspondence in point of government between the large English incorporated towns and German towns of equal size. It should be explained also that the laws to which reference is made later apply to large and small towns equally, whatever their precise measure of local government, and not merely to such populous towns as might suggest comparison with the great English corporations.

† The office has nothing in common with that of the English magistracy; no judicial functions attach to it.

initiate (subject to the mayor's direction) measures necessary for the good government of the town, and particularly to administer (again under the mayor) all municipal institutions and enterprises, including finance and local taxation.

In effect each of the great departments of municipal activity—education, poor law agencies, the control of streets, roads, parks, and public places, the several commercial undertakings, like gas, electricity, water, and tramways, &c.—is in this way brought under the immediate supervision of one expert, trained, permanent, and responsible head, whose particular "ressort" it is.

The members of the executive have a right to take part in all meetings of the Communal Council, and this council has a right to require their attendance for the purpose of obtaining information. Like the mayor, they are elected by the council for a term of twelve years, and as a rule their appointment must be confirmed by the Chief President or Governor of the Province. Most of the members of the executive have worked for a long time upon the council. The salary of a member of the executive seldom exceeds £500, though in Berlin higher payment is made in special cases.

The inner administrative work of a municipality in which members of a Communal Council share is done by committees in the same way as in England. These committees (called variously deputations and commissions) are mixed bodies composed of members of the executive and of the council, with additions from the outside in some cases, and the extent of their jurisdiction is determined by the mayor and executive.

One of the greatest advantages of the German municipal system is its unity. The whole work of local government (allowing for the functions reserved to the police as already stated) is concentrated in the hands of one authority, which, in spite of the devolution of certain powers to subordinate bodies, exerts complete control. Though the taxes levied in a German town are many, falling upon the citizens in varying number and with varying weight, there is only one taxing authority, and all taxes pass into a common fund, from which the needs of the various spending departments are supplied.

II.—THE GOVERNMENT OF BERLIN.

It may be of interest to refer, by way of illustration, to the constitution of the Berlin municipal government. With a population in 1905 of 2,040,148, Berlin has a communal assembly or council of 140 members, one being the president or chairman with a deputy, three assessors and three deputy assessors. Further, 85 citizens are co-opted by the council from the outside to serve in various branches of town work. The members of the magistracy or executive number 34, besides the chief mayor and the mayor, one half being paid.

There are deputations or committees for the following among other matters: Poor law administration, education, finance, taxation, industry (including the supervision of the guilds and the management of technical education), building plans, &c., means of communication (tramways, railways, steamboats, &c.), gymnastic halls and bathing-places, charitable foundations, real estate, hospitals, asylums and orphanages, public health, sewerage and scavenging, the artistic property of the city, public libraries and reading-rooms, waterworks, gasworks, &c.

As a rule the departments are charged with the care of permanent branches of municipal work or enterprise, and the committees for the most part discharge temporary functions. Members of the Communal Council are nominated to these bodies by the Council, but members of the Executive are nominated by the Chief Mayor, who determines the powers and jurisdiction and directs the proceedings of both deputations and committees.

From the gasworks and waterworks the city derives a net revenue of about half a million pounds. Part of the town is still lighted by the "English Gas Company." The electrical power and light works belong to a company. The tramways and the elevated and underground railways are also private undertakings, but from them the town receives a large sum in the form of a fixed share of profits. The amount paid over by the tramway and railway companies and the Electrical Companies in 1905 was £328,400, besides £8,526 in repayment of costs incurred in connection with repairs and alterations to streets, &c.

During recent years the Communal Council has repeatedly affirmed its desire that the municipality should take a more immediate share, not merely in the regulation but in the provision of public means of communication. Hitherto this department of enterprise has been left to the State and to private *entrepreneurs*.

The State owns the metropolitan and circular railways (*Stadt- und Ringbahn*), which afford the quickest facilities for intercommunication between the city and the suburbs, the metropolitan line having 12 stations and the circular line 26. The tramways are almost entirely in the hands of private companies, in virtue of contracts renewed from time to time. The whole of the lines are worked by electric power. In addition there were in 1905 four omnibus companies licensed to use the streets, and they maintained regular communications over 43 routes.

The principal tramway undertaking is that of the Great Berlin Company with 67 lines, while the Berlin-Charlottenburg Company has eight, the West Suburban Company has seven, and there are several minor companies. The contract with the Great Berlin Company expires in 1919, and according to it (in the absence of an agreement to the contrary) all its lines will then revert to the town without any monetary consideration, the company retaining the depôts and rolling stock. It would appear to be uncertain, however, whether the town will be able to enforce this contract, for the tramway company has since its conclusion obtained from the Government a concession until 1949, which concession was granted without the communal authority being consulted.

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Meantime the company guarantees to the town 8 per cent. of its gross proceeds, with the reservation that should the net proceeds in any year exceed those of the year in which the contract was concluded. or 6 per cent. in the case of new capital issued, the company must pay to the town one-half of the surplus. The company must also keep in repair the pavement adjoining the track. The Communal Council further reserves the right to regulate fares, and no higher charge than 10 pfennige (1·2*d.*) may be made for any trip, the result being that passengers may in certain directions travel 12 miles for this sum. In the contract are also introduced provisions for the benefit of the company's employees, including arrangements for pensions.

Apprehensive of the power possessed by the Great Berlin Tramway Company, the Communal Council decided in 1900 that all new lines that might become necessary should be both built and managed by the town. Funds have already been voted for the construction of five short lines, and two of these are nearly completed and will be opened early next year (1908). The town has also bought a large part of the shares of a small tramway company which had not been absorbed by the "Great Berlin."

In inaugurating thus tentatively a policy of municipalisation the Communal Council has expressly disclaimed any hope of immediately obtaining larger revenues than would accrue to it were private enterprise left in full possession ; its object is rather to hold the balance between the community and the existing powerful interests.

In the immediate future, however, the town intends to embark more boldly upon enterprises of this character, and two costly schemes are now being prepared. They are underground (literarily "under-pavement") tramways running from north to south and from north-west to south-east respectively. The lines will follow the centre of the streets, and be as near the surface as possible. The cost of the two projects is estimated at some six million pounds.

Berlin has also systems of overhead and underground railways intersecting the town in several directions, and although these have been constructed by private enterprise the municipality contemplates ownership at some future time. When the first concession for an elevated railway was given in 1895 a certain percentage of profits was by contract (running 90 years) secured to the town, and the Communal Council reserved the right to purchase the undertaking after 30 years, and thereafter at the end of every succeeding ten years, on the basis of 25 years' profits. Underground lines are now being constructed on a general plan, the complete execution of which, by reason of the great cost involved, will take many years.

An idea of the public traffic of Berlin and its suburbs may be formed from the following return of passengers carried in 1905 by the various undertakings above enumerated :—

Number of persons conveyed in 1905 by the undertakings specified.

Metropolitan and circular railways	124,631,616
Great Berlin Tramway Company	350,500,000
Other tramway companies	66,560,296
Overhead and underground railways	37,004,405
Omnibus companies	111,457,043
Total	690,153,360

Among other municipal undertakings and enterprises may be named the 14 market halls, built at a cost, including sites, of £1,400,000, the cattle market and abattoir, river docks, a fire insurance society, a savings bank, and convalescent homes for working people.

Two of the market halls are central halls, both adjoining the Alexanderplatz station, on the main railway, and in the heart of the city. Most of the supplies from the country reach the central markets by rail, though a large quantity of goods comes by water, and it has of late increased. From the central markets the goods are carted to the district markets. During the financial year 1905–6, about 10,000 tons of goods were received at the central markets by rail. The markets are carried on at a profit to the town of £11,000 per annum, and the cattle market and abattoir yield rather more.

The Municipal Fire Insurance Society had 25,958 properties on its books on October 1st, 1905, representing an aggregate insured value of £229,700,000.

Berlin also owned in 1905 land to the extent of 44,385 acres, and to the value of £23,308,000, comparing with 36,892 acres and a value of £21,324,470 in 1902. Of this estate 1,507 acres were within the municipal boundaries, and 43,385 acres in surrounding towns or rural districts. The larger part, viz., 39,200 acres, was taken up by the sewerage farms and works, but 1,309 acres were described as urban and agricultural land intended for building purposes. During the ten years 1895 to 1904 Berlin bought 10,310 acres of land and sold 145 acres. The rents of the town's lands in 1905 amounted to £14,170.

The municipal taxes levied in Berlin during the financial year 1905–6 yielded £1 18*s.* 3*d.* per head of the population. The principal taxes were the income-tax (supplementary to the State income-tax, though levied on the same assessment and falling on all incomes exceeding £45), yielding in the aggregate £1,532,100, the land tax yielding £1,099,360, the commercial occupation tax yielding £466,270, the sewerage tax yielding £314,950, the tax on the sale or exchange of real estate yielding £313,000, and the taxes on large businesses of the type of Harrod's Stores, on licensed victuallers, brewing malt, and dogs.

At the present time, following the example set by Cologne, Frankfort-on-Main, and other towns, the Communal Executive is formulating a scheme for the taxation of the "unearned increment" in land values, known in Germany as the "increased value tax," the principle having already been affirmed by the Communal Council. In several of the

small surrounding municipalities this tax is already in operation, and a number of other communes, both urban and rural, in various parts of Germany, are preparing to adopt it.

No special law is necessary to the adoption of this or any other new communal tax. All that is necessary is that the communal authority shall prepare a scheme and obtain the approval of the higher State administrative officials, who yet possess a veto in the matter. In the case of rural communes the assent of the Government Presidents* is necessary, and in the case of urban communes that of the Provincial Governor, except in Berlin, where the Government is alone competent to approve the introduction of new or the alteration of existing taxes; but in certain circumstances the official named must first report to the Government before signifying assent to taxes proposed by communal bodies.

Among the taxes which have been introduced by many Prussian towns on local initiative may be named the tax on the sale of real estate and the tax on amusements (in the form of a ticket tax or otherwise), besides the "increased value tax" already mentioned.

III.—THE RELATION OF BERLIN TO ITS SUBURBS.

At the present time the city of Berlin is confronted by the difficult problem, how to regulate its relationships and its traffic with the towns which have during the last twenty or thirty years sprung up round about it, insomuch that Berlin has now almost reached the limits of independent extension.

Berlin itself had a population at the census of December, 1905, of 2,040,148, and an area of 15,873 acres, but Greater Berlin, comprising 29 suburbs, had a population of 2,993,441 inhabitants, the increase during five years having been 449,014, or 17·6 per cent. Between Berlin and the outlying towns, which press in every year more closely on every side, there is no administrative unity, and the result is seen in conflicting bye-laws, and the absence of any uniform plan of extension, street building, traffic regulation, &c.

In a memorial on the subject addressed to the Government a short time ago, the Chief Mayor stated :—

> "The city of Berlin in the execution of traffic schemes has to encounter almost insuperable obstacles in consequence of the absence of organisation in Greater Berlin. Every individual commune carries out its own traffic policy without regard to the interests of the whole or even of neighbouring communes."

He also pointed out that for a length of no less than 22,000 yards the boundary of Berlin consists of streets which are common to the city and the suburbs, so that it is only necessary to cross the street in order to enter another jurisdiction, while forty Berlin streets are continued in suburban communes without break of any kind. The incorporation of the surrounding suburbs is regarded as the logical solution of the problem, but though it is understood that the Corporation of Berlin would have been supported by the Government in a proposal of the kind some years ago, it is now no longer regarded as possible, and the end towards which the mayor and executive are working is the adoption of a voluntary agreement by which uniformity of action in matters of common concern may be secured, without any diminution of the administrative independence of the adjoining communes.

Among the matters upon which unity of procedure is desired are building regulations, street building plans, land purchase and land policy, traffic arrangements, sewerage, water supply, sanitation, hospitals, schools, and poor law administration; but Berlin is also wishful to have the incidence of local taxation readjusted, so that out-residents who follow occupations in the city may be made to contribute to the cost of the city's government.

In proof of the great interest taken in the future development of suburban Berlin on uniform lines it may be stated that the Association of Berlin Architects has drawn up a scheme, which is now attracting much public attention, for the systematic laying out, as part of one plan, of an extensive area comprised within a radius of fifteen miles from the centre of Berlin and including at least a hundred townships of all kinds.

It is proposed that due provision shall be made for a network of streets and thoroughfares of width proportionate to their purpose, running into the outskirts and intersecting these in various directions, with special ways for motorists, cyclists, and equestrians; for new railway communications joining those already existing; for tramways, canals, and wharves; for special residential and industrial districts, parks, gardens, lakes, children's playgrounds and other open spaces; for recreation grounds for adults—racecourses, shooting butts, sports fields, allotment gardens, and the like; and sites are to be reserved for public buildings—churches, libraries, museums, schools, theatres, gymnastic, swimming and bathing establishments, hospitals, markets, &c. It may be that so ambitious a plan has little or no prospect of being carried out, but the fact that it has been prepared by responsible men, and that it is the subject of serious discussion, indicates the trend of public thought.

There is greater likelihood that a scheme now being considered for creating a Traffic Union (*Verkehrsverband*) for Greater Berlin, for the purpose of regulating the tramway systems, will before long come into operation, and negotiations are at present taking place between the various communal authorities to that end.

The Traffic Union will be an authority representative of Berlin and the principal suburbs, whose object it will be—

(1.) To take over the existing tramways when the companies' contracts with the various communes now running expire (or earlier if it should be deemed

* The Government President in Prussia is a State official, at the head of the first administrative division of a Province, known as the Government district, below which come the Circles (*Kreise*), at the head of each being a Landrath.

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desirable and arrangements to that effect should be possible), with a view to working and extending them as a collective municipal undertaking, and also

(2.) To construct and work on the same basis such additional lines as the growth of population may require.

Next to Berlin the largest communes to be comprised in the Traffic Union are Charlottenburg with 237,231 inhabitants, Rixdorf with 152,858, and Schöneberg with 140,932. In addition it is hoped that 16 smaller urban communes will join, so that the present population represented by the Union would be nearly three millions. Power is also to be taken to admit rural communes.

All the contracts concluded between the tramway companies and the suburban communes contain the provisions enforced by the town of Berlin, according to which the lines shall revert to the communes at certain dates, and under the Traffic Union scheme each commune would cede to the Union its rights under such contracts, and also transfer to the Union the running powers now enjoyed by the tramway companies.

The funds necessary for carrying out this scheme of municipalisation would be provided by loans taking the form of bonds, for which each commune would be responsible according to its share in the undertaking. Every year a balance sheet is to be drawn up on ordinary commercial principles, and the net profits will be paid to the communes in proportion to their several shares in the gross proceeds, which latter will be based on the estimated traffic passing over the lines in each commune's area.

Every commune will have the right to require the construction of new lines, so long as they do not compete with existing lines, but should the revenue fail to cover the working costs, with interest, the deficit must be made up by the communes at whose instigation such lines were constructed; this liability will cease, however, when for three successive years the lines have paid their way.

A commune may withdraw from the Union, but it must concede to the Union for ninety years from the day of such withdrawal the right to construct and work tramways upon its streets and places, in return for which the Union will pay it one-half of the gross proceeds which would have fallen to it as a member of the Union, after deduction of the costs of working.

The business of the Union will be transacted by the General Meeting and the Executive Committee. To the General Meeting every commune in the Union will be entitled to send representatives, the number of whom in any case may not exceed half the votes possessed by the commune concerned. No commune shall exercise more than a third of the aggregate votes, but in order to avoid the danger of Berlin being outvoted on vital questions it is provided that in exceptional cases resolutions shall need to their adoption a majority exceeding two thirds of all votes.

Eventually the number of votes falling to the various communes will be determined annually by their share in the gross proceeds of the lines during the last year but one, in accordance with the following scale:—Communes which share in the gross proceeds to the extent of £5,000 receive one vote, communes with a larger share receive one vote for each £5,000 up to £100,000, one vote for each £12,500 between £100,000 and £250,000, and one vote for each £25,000 when the share of £250,000 is exceeded.

Until this method of apportionment can be applied it is proposed that the votes shall be allotted as follows:—(*a*) Communes (six in number) with a population not exceeding 10,000, one vote each; (*b*) communes (ten in number) with between 10,000 and 100,000 inhabitants, one vote, and one vote additional for every 10,000 inhabitants above the first 10,000; (*c*) communes (four in number) with between 100,000 and 1,000,000 inhabitants, ten votes, and one vote in addition for every 25,000 inhabitants between 100,000 and 1,000,000, and one vote for every 100,000 inhabitants above 1,000,000; (*d*) Provincial and District Unions (rural communes), three votes each. According to this plan of representation Berlin would have 56 out of 125 votes to be allotted to the 20 urban communes.

The Executive Committee is to be composed for the present of 32 members, viz., five appointed by Berlin, two each by communes with over 200,000 inhabitants, and one each by the other urban communes, while seven members will be allotted to the rural communes and unions between them. In the event of the rural communes and unions being unable to agree as to their representatives, the General Meeting will decide which communes shall exercise a right of nomination for the year. Berlin will appoint both the Chairman and Vice-Chairman of the Committee.

The following among other principles have been tentatively laid down as the basis of such a Traffic Union:—

(*a*) Where, in consequence of the construction of new tramways, streets and bridges need to be widened or altered, the work shall be done by the union or by the authorities concerned at the cost of the union.

(*b*) The necessary alterations, transpositions, and removals of telegraph plant, water and sewerage conduits, wells, planted spaces, &c., shall be effected at the cost of the union, which shall also bear the extra cost incurred by municipal authorities by reason of public works caused by the tramway systems.

(*c*) Should it be necessary to alter, transpose, or remove a tramway it shall be done at the entire cost of the union, which shall have no claim to compensation.

(*d*) All paving or other roadmaking which is necessary in consequence of a tramway shall be executed at the cost of the union, which shall also be responsible for

the maintenance of the road between the rails together with a strip 2 feet wide on either side. MR. W. H. DAWSON.

(*e*) If a municipal authority should at any time alter the road surface, the union must at once bring into line the portions for which it is responsible, and should it be necessary to lay down plant of any kind, necessitating alterations to the tramway track, such alterations shall be done at the union's expense. German Towns.

IV.—THE DEVELOPMENT OF GERMAN URBAN DISTRICTS.

(A).—*Municipal Ownership of Land.*

German towns are greatly assisted in dealing with traffic and housing difficulties, owing to the fact that they generally own a considerable amount of land, both within the municipal area and outside, suitable for building purposes. This is an old tradition of municipal life in Germany, which cannot be attributed to any special legislation, for it goes back to a period long antecedent to the existing system of communal government.

Towns like Frankfort, Mannheim, Hanover, and Strassburg own from one-third to one-half of the entire municipal area; and Berlin, Cologne, Dresden, Munich, Altona, Essen, and Düsseldorf are other towns possessed of a large and valuable real estate. An inquiry made recently in the Grand Duchy of Hesse brought to light the fact that of 51 large communes interrogated, only 21 were without a large reserve of building land.

Amongst notable instances of towns possessed of a large amount of land, the following may be named :—

Towns.	Extent of Townlands.			Population (1905).	Average acreage per 1,000 Inhabitants.
	Within the Municipal Area.	Outside the Municipal Area.	Total (1903 or 1903–4).		
	Acres.	Acres.	Acres.		Acres.
Aix-le-Chapelle	3,379·1	178·7	3,557·8	144,095	24·7
Berlin	1,467·6	38,224·1	39,691·7	2,040,148	19·5
Breslau	2,077·9	14,365·6	16,443·5	470,904	34·9
Danzig	544·7	7,085·1	7,629·8	159,648	47·8
Dortmund	880·7	3,111·0	3,991·7	175,577	22·7
Frankfort-on-Main	10,497·4	887·2	11,384·6	334,978	34·0
Görlitz	420·5	77,339·6	77,760·1	83,766	929·0
Hanover	3,718·1	2,023·4	5,741·5	250,024	203·0
Leipzig	4,600·5	3,905·0	8,505·5	503,672	16·9
Mannheim	5,857·5	115·5	5,973·0	163,693	36·5
Munich	4,566·0	5,694·5	10,260·6	538,983	19·0
Plauen	1,778·9	2,579·0	4,357·9	105,331	41·4
Stettin	735·4	12,164·0	12,899·4	224,119	57·6
Strassburg	6,493·2	5,513·0	12,006·2	167,678	71·6
Wiesbaden	3,465·4	326·1	3,791·5	100,953	37·5

As a consequence of this land policy a German municipal authority generally has land of its own suitable for public works which it desires to take in hand; it can determine within certain limits in what directions the town shall extend; by the steady increase in the value of its estate it shares with private owners in the material gain caused by municipal growth and development; and it is able to some extent to check land speculation.

Several German Governments have of late years urgently advised municipal authorities to pursue the policy of land purchase even more energetically. In a joint Decree issued on 19th March, 1901, to the Government Presidents of Prussia, the Ministers of Trade and Commerce, Education, and the Interior of that State said :—

> "A judicious communal land policy is of far-reaching importance for the better adjustment of housing conditions. The existing evils have their chief source in unhealthy land speculation, which in part can only be combated by changes in legislation. A powerful means of checking this speculation is, however, available at present in the acquisition of as much landed estate as possible by those communes whose continuous growth converts the surrounding agricultural and garden land in ever increasing measure into building land. The manner in which the land so purchased, which as a rule should permanently remain in the hands of the commune, should be used for building—whether the commune itself, either directly or through contractors, should erect dwellings upon the land and either let or lease them, or whether houses should be built on leasehold tenure,—must be left for each commune to decide for itself.
>
> "It is, however, specially consonant with a healthy land policy that the land in the possession of a town which is suitable for small dwellings should on principle not be sold, even though a temporary dearth of dwellings should exist. The sale of communal land for the purpose of combating the dearth of dwellings may indeed have the momentary effect of causing dwellings to be built and offered in larger number and at lower rents, but in the end it can only serve the ends of land speculation. The sale of communal land for the erection of small dwellings can only be judicious if the

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commune reserves a right of pre-emption, or if other effective security is offered that the land will not become the object of private speculation."

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On March 31st, 1903, the Saxon Minister of the Interior issued a similar admonition to the communes in that country to "increase their estate betimes to the extent of their power," yet to refrain from trafficking in land for the sake of gain, but rather to retain all in their possession, and only to sell where there was a guarantee that no speculation would take place.

(B).—*The laying out of new Areas.*

Town planning has for a long time been carried out on very systematic principles in some parts of Germany. Great care is taken to anticipate and provide for future needs as far as possible. It may be noted that the "needs of the near future" are assumed to be the needs that are likely to arise within a period of twenty-five years.

The usual method in the formulation on a large scale of town building plans is to divide the urban area into building zones, to each of which are allotted a different social purpose and in consequence a different architectural character. A special district is invariably set apart for industry, and here alone may factories and large workshops be erected; another district is usually reserved for residences of a better class; another for working-house dwellings, and sometimes there is a "country house zone" in which villas surrounded by gardens and land may alone be erected.

In each of the zones ample space is reserved for streets, gardens, and other open places The width of the streets varies according as they are main arteries, secondary thoroughfares not intended for heavy traffic, or are merely intended for local use. It is not unusual for new main streets in large towns to be divided into sections, each devoted to a distinct kind of traffic. For example, on each side of the street, divided in the middle by an avenue of trees, may be found in succession trottoir, carriage way, tram lines, and foot way or riding way.

In the laying out of new districts traffic is sometimes relieved by running auxiliary streets parallel with the main arteries, thus allowing of the division of traffic. Where the street is wide enough the tram lines often run in the middle, and at important stopping places there are islands which serve for up and down traffic.

During the present year (1907) the Prussian Minister of Public Works issued an Order to communal authorities laying down the lines upon which town planning should take place in rapidly increasing places. It stated :—

> "In areas subject to rapid development it is not judicious to fix building lines in every individual case just when the land is to be built upon. Rather should steps be taken to prepare general building plans proceeding from broad standpoints. The provision of suitable traffic ways, besides foot pavements and carriage ways and the provision of space for promenades, tramways, and cycle tracks should be borne in mind."

(C).—*Compulsory Expropriation in the interest of Town Improvements.*

The following notes summarise the main principles which underlie German legislation on the subject of compulsory expropriation in the interest of town improvements.

No general law applicable to the whole Empire exists upon this subject. The question of expropriation is, indeed, dealt with in the Imperial constitution, but only in relation to the construction of railways which may be deemed to be necessary for national defence or in the interest of the whole Empire, and even here expropriation must be legalised by special statute in each individual case. Most of the federal States have Expropriation Acts, some of them going back to the first half of the nineteenth century.

Two methods of expropriation are followed :—

(*a*) Either the principle of expropriation for reasons of public interest is laid down in general terms, without specialising permissible objects of expropriation, or

(*b*) The cases and the circumstances in which expropriation is permissible are particularised.

The Law of Baden of August 28th, 1835, and the Law of Prussia of June 11th, 1874, are illustrations of the first method; the Bavarian Law of November 17th, 1837, is an illustration of the second. In general, the application of expropriation in any given case is authorised by Royal Ordinance or Ministerial Decree, and no special or local statute is necessary to put the law in operation. The State of Hamburg is, however, an exception to this rule.

The cases in which expropriation is declared by the Bavarian law to be permissible are :—

(*a*) The building of fortresses and other works for national defence, including military establishments of all kinds;

(*b*) the building and enlargement of churches, public schools, hospitals, and lunatic asylums;

(*c*) the laying out or extension of graveyards;

(*d*) the rectification and deepening of rivers and streams;

(*e*) the construction of new, or the extension, curtailment, or levelling of existing State, circle (Kreis), and district roads;

(*f*) the construction of public water conduits;

(*g*) the draining of noxious swamps in the neighbourhood of towns;

(*h*) protection against floods;
(*i*) the construction of public canals, locks, and bridges;
(*j*) the construction of public harbours or the extension of existing ones;
(*k*) the construction of railways;
(*l*) the construction of telegraphs for the State service;
(*m*) measures required by the public health and safety; and
(*n*) measures to protect against fire and other danger the State's artistic treasures and scientific collections.

In the case of Hamburg, the State (*i.e.*, the Senate and House of Burgesses) is, by Law of May 5th, 1886, amended September 27th, 1899, empowered to pass a decree of expropriation for the purpose of executing works of public interest, and particularly the building and rectification of streets and canals, the construction of public buildings, railways, harbours, dykes, and river improvements, in return for full compensation both for value taken and loss inflicted. Whether the proposal to expropriate emanates from a State authority, from a commune, or from a private person, the decision as to its permissibility rests with the two Houses of Legislature. After a decree of expropriation has been passed, if no agreement has been arrived at as to the compensation to be paid, the matter is carried before a Commission of Assessment consisting of one judge, as president, and two assessors. Experts are heard, and either party can appeal against the Court's decision, but only to a second Court, consisting this time of two judges and three assessors, none of whom can have taken part in the first proceedings. Resort to the ordinary Courts of Law is not allowed.

(D).—*Expropriation for the purpose of Town Planning.*

During recent years a strong tendency to embody the principle of compulsory expropriation in State Building Acts, and through them in local statutes, has asserted itself in Germany, the object being to ensure the development and extension of towns on rational and healthy lines.

Legislation of this kind, however, is not new in Germany. As early as 1845 the Duchy of Saxe-Meiningen passed an Expropriation Law providing that "the compulsory cession of landed property can be required for the . . . . . advantageous extension of towns and the necessary enlargement of villages, the construction of a straight or new street in towns, the laying out and extension of market places, churches, schools, hospitals, and other public buildings, and the re-erection of public or private buildings that have been destroyed in so far as the general building plan shows an alteration of the earlier sites to be necessary, &c."

The modern State laws on town planning go beyond this, however, for as a rule they provide for the compulsory collation or "pooling" of entire areas of undeveloped urban land with a view to the re-distribution of this land amongst the various owners, in the old proportions either as to area or value, in such a way as will best promote the opening up of the ground, the laying out of public streets, roads, and spaces, and the advantageous use of building plots. Several months are as a rule sufficient to the carrying out of a scheme of expropriation of this character, and the procedure is not attended by serious expense.

The general principles followed by laws of this kind are here indicated.

(E).—*The Law of Baden.*

The best known German Law on the subject of town planning is the Township Street Law of Baden, dated 6th July, 1896. As the title indicates, the Law applies to township streets as distinguished from main highways. It provides (section 2) that—"In order to the laying out of township streets, plans shall be prepared in a form corresponding to the needs to be contemplated." Precautions are taken against dilatoriness on the part of towns in preparing such plans, and the Act (section 10) gives power to prohibit persons from building outside the area already enclosed by a town, and where Town Building Plans exist outside the area covered by these plans, if there should be reason to apprehend "obstacles in the way of the suitable continuation of the Town Building Plan."

Further (section 11): "Where a building plan has been prepared, but the suitable building of the land embraced by the plan would be obstructed by the position, form, or area of the properties, a redivision of the properties for the purpose of securing more advantageous sites, either by collation or the alteration of boundaries, may take place on the application of the Communal Council, even against the will of the owners, so far as such redivision is in the public interest, and the land necessary for the laying out of the streets has either been obtained for this purpose, or will be obtained before the redivision is effected."

The procedure prescribed is as follows. The whole of the properties to be redivided, including such public roads as will become superfluous by the rearrangement, are pooled. Before the redistribution takes place, the land required for the new streets and places is set apart and apportioned to the commune. The rest of the area is divided amongst the various owners in the proportions in which they were originally interested. For every single piece of property which in point of size was before the pooling suitable for building, one or more building sites adjoining a street are to be returned to the owner, as far as practicable in the same situation as before. Properties so small that they would have to be exchanged for plots unsuited for building purposes, unless they can be thrown together to other properties belonging to the same owners, so as to make suitable building plots, must be ceded in return for compensation to the commune, which will pool them with the rest of the land and apportion them amongst the owners.

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Unavoidable differences in value, both under and over the apportionment due, are to be adjusted by money payments, the commune receiving the excess value from those owners who receive too much, and paying the deficit to those who are allotted too little. The commune must also compensate the owners for the land which it takes for public streets and places over and above the amount of its own land which it pooled, and this compensation may take the form of land which the commune may own within the area collated or which may fall to it by the redivision. So far as compensation is given in money, the provisions of the Baden Law of August 28th, 1835, on compulsory expropriation shall apply.

When a communal authority proposes to re-divide the properties within a given area, it must prepare a plan showing the existing and the proposed apportionment of land, and opportunity must be given to all persons concerned to protect their interests. The preparatory work completed, the plan must be deposited with the District Administration (Bezirksamt)* with full details of the scheme proposed, and this body refers the plan with all objections raised against it to the District Council, building operations being in the meantime prohibited within the scheduled area.

Should the District Council be of opinion that the plan is not in the public interest, or that the objections raised against it are well-founded, it may reject it. Within a month the communal authority may appeal to the Ministry of the Interior against such decision, but should the Ministry endorse the opinion of the District Council, its decision is final and the matter is determined. Should the District Council approve the plan it notifies the Ministry of the Interior to that effect, but this Ministry may still either approve or reject the plan, but in the latter case the communal authority may appeal to the full Ministry of State. A plan having been definitively approved, it rests with the communal authority to execute it, and while it must do this in the first instance at its own costs, it may later, with the consent of the Ministry of State, charge all its expenditure under a plan of collation to the owners proportionately to the benefit which they derive from the re-distribution of the properties.

On the strength of this law the Communal Council of Mannheim adopted, on March 11th, 1889, a series of "general principles relating to the return of the costs of street construction," as follows :—

> "Besides the value of the land used for new or existing town streets yet unbuilt upon (which shall be the current value or original cost), the expenditure incurred in the first construction of the streets in a manner corresponding to the needs of traffic, including the over-ground channels serving for the conveyance of water, shall be entirely refunded to the town by the adjacent owners according to the length of their several frontages, as soon as they shall execute buildings upon their properties. and so far as owing to the existence of these buildings with their appurtenancs, such as courts, entrances, gardens, business and warehouse places, &c., the plots may be regarded as built upon. Nevertheless, the owners can only be required to bear the cost of street making to the extent of a width of 29¼ feet on either side.
>
> "The owners of existing buildings adjoining such streets shall be required to refund a proportion of the costs referred to, such proportion to be fixed in each case by resolution of the Communal Council, when the streets offer them conspicuous advantage.
>
> "The costs of constructing all subterranean conduits of the town passing before the properties shall fall upon the municipality in so far as such works are executed by the municipality in the public interest."

(F).—*The Law of Saxony.*

A similar Law exists in Saxony (July 1st, 1900). This Law provides for the issue of local statutes regulating buildings, the adoption of building plans for undeveloped areas, and the collation or "pooling" of properties in different ownership, with a view to the more advantageous laying out of particular areas. These local statutes do not require the sanction of the national Parliament, but, after being elaborated by the communal authorities (whether urban or rural), only require the sanction of the Minister of the Interior.

In case of "urgent need" communal authorities may be required by the higher State administrative authorities to adopt local statutes or to amend existing statutes on the lines of the present law, and in default the Minister of the Interior may step in and act in their stead.

Sections 15 and 16 set forth that where it is desired to open up for building purposes an area which is "in the main not built upon," a building plan taking the form of a local statute shall, as a rule, be adopted. Such plans shall regulate the building lines, the method of building, the situation, height, and purpose of the buildings to be permitted, the rectification of watercourses, the draining of the area planned, and the subways and overhead ways of streets.

In the preparation of a building plan (section 18) due allowance is to be made for the requirements of the public traffic to be anticipated, for the development of the town or

* In the Grand Duchy of Baden the Circles (Kreise) are divided into smaller districts, called Bezirksämter, at the head of each of which is the Bezirksamtmann. The executive authority for the district is the Bezirksrath, rendered here District Council.

district, the need for dwellings that is likely to arise, and the requirements of public health and safety, and the following, among other points, have to be borne in mind :— MR. W. H. DAWSON.

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(*a*) The width of the streets and footways must depend upon the needs of local traffic, and be graduated according as a street is intended to be a main street, a secondary street, or only a residential street. Streets with busy traffic must be at least 55¼ feet wide.

(*b*) Gradients must, as far as possible, be equalised; steep gradients and straight building lines of excessive length must be avoided.

(*c*) In fixing the direction of streets provision must be made for short and convenient connections between one street and another, and between these streets and the principal traffic centres.

(*d*) Open spaces and planted areas should be provided, conformable in size, position, and number to the needs of traffic and the public welfare. Sites for churches and schools, and for playgrounds and recreation grounds, are to be provided in sufficient number.

(*e*) In laying down rules as to the method of building to be allowed, and as to the permissibility of factories and industrial works, the past character of the town or district and the existing need should be considered.

Should no objections be taken to a building plan which has been formulated it passes direct to the Minister of the Interior for sanction.

The provisions (sections 54, &c.) as to the pooling of land and its subsequent redistribution are much the same as those in the law of Baden. This procedure may be set in operation by the Building Police Authority acting on a resolution of a Communal Council or on application by more than one-half of the owners of the area affected, provided they also own more than half the land.

The Act also provides (sections 68 to 71) :—"Should the demolition of buildings or groups of buildings be indispensable in the interest of traffic or of the public health, and should the building plan for an area whose buildings have been destroyed by fire, water, or other natural forces, be incapable of execution otherwise in such a way as to avert similar dangers, the Minister of the Interior may, on the application of the communal authority, confer powers of expropriation in respect of the entire area necessary to the advantageous carrying out of the undertaking. . . . Before the application is served on the Ministry of the Interior the Building Police Authority shall endeavour to effect an amicable agreement amongst the persons interested.

"After the granting of the right of expropriation it shall be competent for the property owners under section 68 themselves to execute the new buildings contemplated in the building or expropriation plan on their own property within a period to be fixed by the Minister of the Interior On the expiration of this period those properties or portions of property which have not by that time been built upon according to plans are forthwith expropriated."

(G).—*Town Planning at Frankfort.*

One of the best known local statutes dealing with town planning is that which was adopted by the town of Frankfort-on-Main in 1903. It provides for an extensive use of the power to collate and redistribute inconvenient building plots within scheduled areas. Before the law can be set in motion, it is required that the Communal Executive shall prepare a complete plan of the properties to be pooled, together with a register of the owners, and both plan and register must be deposited for public inspection, objections being invited within a period of four weeks. These objections are, as far as possible, to be satisfied by friendly means, and the time of grace having expired, the proposal goes forward to the District Committee, which pronounces a definite decision, after hearing the Police Authority, on the question whether legal conditions and requirements have been complied with, and after considering unsettled ojections.

The laying together and pooling of properties having been authorised, the Government President nominates a commission to carry out the measure, two of whose members shall represent the President, and shall be the chairman and vice-chairman of the commission respectively, while the other members shall include at least one building expert, one legal expert, one certificated surveyor, and a land valuer. Members of the Communal Executive may not sit on the commission, but in the appointment of its members both the Executive and the property owners shall be heard.

The costs incurred by the municipality under this procedure are to be apportioned amongst the several owners according to the advantage accruing to them, if that method be practicable, or failing it according to (*a*) the frontage, area, and position, or (*b*) the value of the properties allotted, but an owner has the option of paying interest on the capital sum of his share of costs at the rate of 3½ per cent. until his property is sold or built on. Should an owner be dissatisfied with compensation payable in money, he may go to law within two months of the laying together of the land, but the execution of the plan of redistribution is not delayed thereby. Should the costs of the municipality be increased owing to legal proceedings, the Communal Executive may charge the excess to the owners.

(H).—*Street Improvements in Hamburg.*

The State of Hamburg, by a Law of June 23rd, 1882, entitled the Building Police Law for the Town of Hamburg, the Township of St. Paul's, and the Suburbs, assumed far-reaching powers in regard to street planning. It was stipulated that immediately on the

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publication of a resolution of the Senate and House of Burgesses signifying their intention to lay out a street, no land in the neighbourhood of that street might be built upon, and the town could claim the right to acquire a certain portion of such land for public purposes. In fixing the price the additional value to be expected from the construction of the street should not be considered. The Law provided for the laying out into streets of eligible building areas in the outskirts, but stipulated that a building plan of this kind must join on to the principal traffic roads of the district, and must not create obstacles in the way of the opening out of main arteries which might in the future be necessary for the development of other outer districts. In such a building plan also provision should be made for a sufficiency of streets and open spaces. Permission is only given in exceptional cases to private persons to lay out streets within undeveloped areas, and even then only on condition that such streets shall not stand in the way of the later development of the land on rational lines, and that the owners concerned give an undertaking to cede to the town such land as may be necessary for additional cross-streets and public places.

Reference may also be made to Article 16 in the series of Model Town Building Regulations drawn up by the Wurtemberg Minister of the Interior, which runs :—

> "If in crowded parts of a town the demolition of buildings appears desirable in the interest of traffic or the public welfare, compulsory expropriation shall be permissible on the application of the municipal authority in respect to the properties and the rights appertaining to them needed for the satisfactory execution of the undertaking, according to the provisions of the law on compulsory expropriation of December 20th, 1888 . . . . . The expropriating authority is the Ministry of the Interior.

W. HARBUTT DAWSON.

APPENDIX E.—II.

The Government and Extension of Washington, U.S.A.

CONSTITUTION.

The Government of the City of Washington is included in that of the District of Columbia.

The territory of the District, comprising 72 square miles, was constituted the seat of Government in 1790, although the title of District of Columbia does not appear in the Statutes until 1796.

The City of Washington has been built upon a settled plan from the beginning, the City being divided into sections by main thoroughfares radiating from the Capitol, where Congress sits.

The present form of government of the District of Columbia was provided for by an Act of Congress approved June 11th, 1878, and this might be called the "Constitution of the District of Columbia." The executive authority consists of two Commissioners appointed from civil life by the President of the United States at salaries of $5,000 each, and an officer of the Corps of Engineers, detailed as a Commissioner of the District of Columbia, who receives from the District of Columbia a sufficient sum in addition to his pay as an officer of the army to make it equal $5,000.

The Act of Congress which established this form of government in 1878 expressly declares that the District of Columbia shall remain and continue a municipal corporation, and that the Commissioners therein provided for shall be deemed and taken as officers of such corporation.

All legislation for the District is by Act of Congress, except police, building and other municipal regulations which are made by the Commissioners of the District of Columbia under general authority of Congress.

Under the organic Act of 1878 it is provided that one-half of the expenses of the government of the District of Columbia shall be paid from the United States Treasury and the other half from taxes levied on real and personal property, licences and other miscellaneous receipts, paid by the citizens of the District of Columbia. The tax rate is $1.50 per hundred for both real and personal property. The Commissioners are paid out of funds appropriated by Congress, one-half of which comes from the Treasury of the United States. The control over public streets and property is vested in the Commissioners, with exceptions as to United States Government buildings and reservations in the District, which are under the control of the Secretary of War. They have powers to expend such funds as are appropriated by Congress, but they must submit each year to Congress through the Secretary of the Treasury a statement showing in detail the work proposed to be undertaken with the estimated cost. They collect the taxes, but all taxes

collected are paid into the Treasury of the United States, where they are held as District of Columbia revenues. The Secretary of the Treasury makes a statement on the Estimates; statement and estimates together are then sent to Congress, which uses them as a basis for making appropriations. The annual budget is about $12,000,000. Washington U.S.A.

All works are carried out by contract under the supervision of the Commissioners, except for laying water mains, and minor undertakings of less than $1,000 in amount. All street railways operating in the District of Columbia do so under charters obtained from Congress. Bills are introduced for this purpose, and referred to the Commissioners for report as to routes, &c., and when the charters are granted the route is laid down by the law and the requirements as to construction, operation, and supervision are placed in the Commissioners. The street railways do not pay anything for the franchises they obtain from Congress, but they do pay, as taxes, 4 per cent. of their gross earnings and a real estate tax of one dollar and a-half per hundred on realty which they own. Their tracks are not assessed as real estate.

Street railroad companies pay a portion of the cost of laying street pavements under a statute which enacts, *inter alia*:—

> "And when any street or avenue through which a street railway runs shall be paved, such railway company shall bear all of the expense for that portion of the work lying between the exterior rails of the tracks of such roads and for a distance of two feet from and exterior to such tracks and of keeping the same in repair." But the railway companies having conformed to the requirements of the Commissioners, "the United States shall pay one-half of the cost of all work done, except that done by the railway companies, which payment shall be credited as part of the fifty per cent. which the United States contributes toward the expenses of the District of Columbia for that year."

All payments are made by the Disbursing Officer of the District of Columbia on itemized vouchers, audited and approved by the Commissioners, the money being obtained from the Secretary of the Treasury upon requisition of the Commissioners.

Legislation for the District of Columbia is prepared by Committees of the Senate and House of Representatives. The Commissioners report upon Bills and Resolutions referred to them by these committees, and they also present Bills and Resolutions for the consideration of Congress. When these are passed by both Houses of Congress and signed by the President of the United States, they become law. Before measures reach their final stage they are referred to the Commissioners by the President for comment.

Urban Extension.

In 1893 an Act was passed to regulate the extension of highways in that part of the District of Columbia which lies outside the City of Washington. Under this Act a "highway commission" was appointed, and the Commissioners of the District were charged with the preparation of plans, to be approved by the "highway commission." When approved the maps were recorded in the office of the Surveyor, and any future subdivision of land was required to conform with these plans. Before the streets and highways laid down in the plans became public ways they must either be dedicated or condemned, and in condemning them a proportion of the cost is assessed by a jury on adjacent land as benefits. Condemnation proceedings are instituted in the Courts.

The Commissioners reported upon this new department of their work in 1896 and subsequent years. The following passage is quoted from the report for 1897:—

> "The constitutionalty of the Highway Act having been affirmed by the decision of the Supreme Court, the plans of the second section, which had been completed and signed in January, were forwarded to the Highway Commission for revision, and at the present writing are in the hands of the Commissioners, having been referred back for report on various protests. The plans of the third section embracing the territory west of Rock Creek are now ready for transmission to the Highway Commission. The plans of the fourth section have been partially prepared. The cases arising in the recorded sub-divisions under the first section are now in the Courts. The experience of the past year has shown the desirability of certain amendments of the Act of March 2, 1893, and the recommendations for legislation thereon will be forwarded early in the next session of Congress."*

There is some indication of the rate of urban increase in another passage of this report, where the Commissioners urge a demand for a grant in respect of suburban streets and county roads. In the course of their argument they mention that in the past 10 years the mileage of these roads had been increased from 150 to 207 miles. They point out the benefit to all classes in the city which the roads afford for healthful recreation, through the use of cycles, and the report proceeds:—

> "With good roads and bicycles, suburban districts become available for residences of persons of small means doing business in the city; with them the bicycle and tricycle have facilitated business deliveries for small dealers; and furthermore, inasmuch as the perishable supplies of the surrounding country are brought over them into the city, the better the roads the cheaper this produce can be delivered. Although lying out of the city, they form a most important adjunct to city life."

* These amendments were made in 1898.

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The police force for the District of Columbia is under the control of the Commissioners, and in their Report for 1899 and subsequent years, to date, they have put in a plea for a substantial increase. Incidentally they present their general view as to the status and condition of the District in the following passage :—

"It may be a repetition to give some of the reasons why there should be a substantial increase of the force, but it is thought best to do so. It should be considered that this is the capital of the United States situate in the midst of a territory comprising 72 square miles, all thickly settled, and that the population in the outlying portions of the District is rapidly increasing, owing to the extension of modern street railway facilities.

"Within this police jurisdiction, the fourth largest in the United States, are hundreds of acres of public reservations; numerous large government workshops; Rock Creek park, with its 1,600 acres; magnificent institutions of learning; many costly residences, including those of the principal Government officials and foreign legations; several railroad depôts, all of which have to be carefully looked after and protected by the police force; and this, too, when the number of officers on duty at any one time does not exceed 160. In the country portion of the District each beat comprises several square miles, while in the heart of the city an officer is required to patrol from 3 to 10 lineal miles of streets."

In the same report (1899) the Commissioners state that the highway plans for the entire district west of the Anacostia River have been completed and approved by the Highway Commission and placed on file in the surveyor's office as required by law.

The following year, 1900, the Commissioners reported to Congress that the work of mapping and planning was complete. The benefits in prospect were also described as follows :—

"During the year the last section of the highway plans was completed and placed on record. These plans now cover the entire District of Columbia and are of inestimable value as a guide in laying out streets and sub-dividing land. Now an owner in any part of the District, however remote from the City can, if he so desires, lay out his streets and sub-divide his property with the knowledge that ultimately when the City reaches him, his sub-division will be in accord with the City plan, and connect smoothly with streets extended from the City."

The working of the Highway Act may be seen in the case of the extension of Sixteenth Street, on which the Commissioners reported in 1902.

"On March 13th, 1899, an Act (subsequently amended) was approved authorising the extension of Sixteenth Street from Morris Street to the District line, a distance of about five miles. About 50 acres (more than 75 per cent. of the land within the street north of Piney Branch Road) were dedicated for the extension of the street. Proceedings were then undertaken for the condemnation of the remainder of the land necessary. The jury began its labours December 4th, 1900, and rendered its verdict May 27th, 1901. The verdict awarded damages to the extent of $729,952.29. Benefits were assessed on abutting property to the amount of $108,834.75.

"The verdict was finally confirmed by the Supreme Court of the District of Columbia, April 19th, 1902. Shortly afterwards the auditor began the payment of the awards. This work necessarily has proceeded slowly, as the title to each parcel of land has to be examined before payment can be made.

"During the latter part of September, houses within the lines of Sixteenth Street, as extended, were advertised for removal, and their removal was begun during the first week in October."

These particulars sufficiently indicate how the principle of town-planning has been applied in regard to Washington. The highways were extensions of the plan of the City as laid out by L'Enfant. The present position is officially summarised thus :—

"The highway extension plan covers the entire District of Columbia, and generally follows the original plan of the City of Washington, the streets of the City being extended into the suburban portions of the District and the cross-streets and avenues forming what may be termed a gridiron system of streets. The original highway Act provided for condemnation proceedings to acquire all of the highways laid down on the plan, but the cost of this procedure being prohibitive, the Act was amended in 1898 so as to eliminate the directions to condemn all the highways, but to leave the plan to provide for such future condemnation as might be especially authorised by Act of Congress, and to require that in the development of suburban property the streets as laid down on the plans should be dedicated by the owners of the property in sub-dividing it into building lots. Several highways have been acquired in these two ways, and at every session of Congress special Acts are passed opening or extending highways according to this plan."

Extension and Finance.

The Act of Congress authorising the system of urban extension which has been described, led to a question as between the United States and the District of Columbia, the discussion of which in the reports of the Commissioners may now be briefly noticed. The interest of the discussion arises from the peculiar position of the District as a municipality under the immediate control of the Central Government. The expenses attending urban extension entailed the necessity of advances being made by Government under the

authority of special Acts. Each year since 1901, such Acts had been passed by Congress, the advances had been made, and the work of urban extension had proceeded. But these advances had to be repaid with interest from the current revenues of the District. On the other hand the growth of the District entailed road-making, water supply and sewerage, besides additional cost in municipal services. It became necessary to build a new municipal hall called the District Building, and the Commissioners looked to the Central Government for some additional financial support. However, in the result the liability of the United States was limited by an Act of Congress dated March 3rd, 1903. Washington, U.S.A.

This Act, which is quoted in the Commissioners' Reports for 1903 and 1904, authorised the Secretary of the Treasury to make advances to meet the general expenses of the District, and to re-imburse the Treasury for the portion payable by the District, out of the taxes and revenues collected for the District. It was further provided :—

> "That nothing contained herein shall be so construed as to require the United States to bear any part of the cost of street extensions, and all advances heretofore or hereafter made for this purpose by the Secretary of the Treasury shall be repaid in full from the revenues of the District of Columbia."

In their estimates the Commissioners had assumed a distinction between cost of improvements and current expenditure. In view of the above limitation by Act of Congress they now seek to justify that distinction. They desire to be placed in an equal position with ordinary municipalities which are empowered to raise money for improvements repayable by instalments over a long period. They define their position as follows :—

> "This year, as in the two preceeding years, the Commissioners have prepared the estimates for the appropriations for the District of Columbia for the next fiscal year upon the principle that, presenting to Congress the actual needs of the District of Columbia, they should distinguish and ask Congress to distinguish, between current expenditures and those for extraordinary projects of improvement demanding large sums of money within a short time and extending their benefits into the future. Everywhere else it is recognised that the cost of such improvements cannot be met out of current revenues, and ought to be spread over a series of years, and therefore it is customary to meet it by an issue of bonds with the usual provision for repayment by a sinking fund. The United States does not have to borrow money in any way to meet its share of such expenditures in the District of Columbia. But the District of Columbia must borrow money like any other municipality to meet its share of the cost of such improvements, because its current revenues cannot meet immediately such extraordinary demands without compelling such a reduction in current expenditures as would cripple the municipal services."

In the report for 1904 the argument for making special provision to meet extraordinary expenditure due to extensions and improvements is stated at greater length and with more emphasis. It is shown that the works sanctioned by Congress cannot be continued under an arrangement by which half of the cost contributed by the District is payable from current revenue. The Commissioners appeal to Congress to "provide permanently for financing the District's share of the cost of the extraordinary municipal improvements required by the necessities of the District, and authorised and directed by Congress." They urge that the arrangement between the District and the United States is in effect a partnership, and conclude their representations in the following words :—

> "Knowing that Congress would not authorise a bond issue such as would be made elsewhere for this purpose, the Commissioners recommended that advances should be made from the United States Treasury by the partner, the United States, to the partner, the District of Columbia, the former having the custody and control of the revenues of the latter and also the sole power of appropriation and of authorising extraordinary projects of improvement, so that nothing could be done without its action. These advances were to be repaid within a reasonable period of years and with interest.
>
> "It was estimated by the Commissioners that not more than $10,000,000 would have to be advanced on this account for all projects authorised or likely to be authorised by Congress. Congress accepting the principle in part, made temporary provision in the Acts of February 11, 1901, July 1, 1902, March 3, 1903, and April 27, 1904, for advances from the Treasury, to meet any deficiency in the district revenues, on a general account, mixing both extraordinary and current expenditures, and without separate provision for the extraordinary improvements which alone are responsible for a deficiency in the district revenues, since the latter are ample for all current expenditures. As this legislation expires the 1st July next there is no provision for the district's share of the extraordinary expenditures of the next fiscal year nor the following fiscal years."

The consequences of extension appear also in the Report of the "Major and Superintendent of the Metropolitan Police Department", who again, in 1903, represented the inadequacy of the protection afforded to the district. He describes it as "This immense and well-populated territory" with over 500 linear miles of streets and nearly 200 miles of roads; and he enumerates the localities comprised in the district thus :—"The Cities of Washington and Georgetown and many suburban villages, including Anacostia, which is across the eastern branch of the Potomac River, Takoma, Bennings, Deanwood, Congress Heights, Brightwood, Cleveland Park, American University Park, Chevy Chase, Mount Pleasant, Brookland, and other thickly settled communities." He further points out that it is the third largest police area in the United States, and the only territory having a municipal police control. The Commissioners estimated the population in 1903 at 295,000.

The development in the official regulation of urban extension may be traced in the yearly reports of the assistant engineer. In 1903 for instance, he states that :—"the special

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maps relating to sub-divisions and records of highways have been added to from time to time, so as to keep the latest record, and a number of them have been lithographed for use in the various Departments of the District Government." In his statement for 1904, again, "Reports, estimates, and maps have been made on the various Bills or requests for street opening or extensions, the following being the Street Extension Bills introduced during the past session of Congress." After enumerating these, he proceeds "The following street extension measures were passed during the last session of Congress, and proceedings have, in accordance with law, been commenced under the first seven street extension Acts named below." The enumeration follows, and he concludes with the statement that the special maps have been added to from time to time and constantly show the last-numbered lots of record.

The Commissioners report to Congress in 1904 the progress made in street extensions, and recommend in each instance that one-half of the cost should be borne by the United States. They proceed: "As the laws were passed, however, the entire cost was charged to the District of Columbia, one half being assessed against the abutting property, the assessments being payable in five equal annual instalments." Elsewhere it is stated that, under the law, half the cost of side walk work is paid by the owners of the abutting property. Thus it appears that half the total cost of extension is charged to abutting property.

The scheme of extension involved the building a new bridge :—

> "The Commissioners have also included in the estimates an item of $50,000 for constructing a bridge across Piney Branch on the line of Sixteenth Street extended. This bridge is necessary on account of the grade of Sixteenth Street, which will cross Piney Branch at an elevation of about 60 feet, which will require the construction of a viaduct about 300 feet in length. It is intended that one or two streets and one of the avenues of the highway-extension plans shall be carried under this viaduct, the grade of Sixteenth Street making this necessary. The necessity of keeping up the grade of Sixteenth Street is because of the high ground to the North and South of Piney Branch, and the desirability of having as easy a grade as possible on this main thoroughfare. Present appropriations provide for the improvement of Sixteenth Street to within a short distance of Piney Branch, and in order to carry improvements further northward, it will be necessary to provide for crossing the Piney Branch Valley."

Such works, however, must be paid for out of the revenues of the District, although the subsequent cost of maintenance and additional service is shared by the United States. The position of the matter at the end of 1907 has been officially described as follows :— "With reference to the matter of segregation of current expenditures and what are called extraordinary improvements, the Commissioners have asked for such a segregation, but Congress has not deemed it advisable to grant such authority, and all expenditures, whether current or otherwise, must be paid from current revenues, and when these are insufficient the Appropriation Acts as passed by Congress provide that the money necessary shall be loaned to the District of Columbia by the United States, two per cent. interest being charged."

Contingent Utility of Extension Plans.

On the basis of the highway extension plans a system of numbering squares for the identification of property sites was introduced, for the purpose of assessment and to assist in the recovery of taxes in arrear. In their report for 1903 the Commissioners refer to this work :—

> "The adopted highway extension plans which cover the entire District of Columbia have already divided the district into squares, so that it is now possible to devise a system of numbering which would be regular and consecutive for the entire District . . . . The squares of Georgetown were all re-numbered in this manner when it was made a part of the City of Washington some years ago."

In the report of the Assessor to the Commissioners, dated November 10, 1904, this interesting aspect of the extension plans is referred to in more detail :—

> "At the last session of Congress the Commissioners, upon the recommendation of this Office, submitted a draft of a Bill to distinctively designate lots and parcels of land in the county. . . . Plats covering most of the county have been prepared under the direction of the Engineer Commissioner (as an incident to the completion of the permanent system of highway plans) which are now of record in the office of the Surveyor, and are considered far superior to any other plats in existence. This platting was based on an extensive system of measurements and triangulation made by the engineer department and consists of 160 sheets, 24 by 32 inches, drawn to a scale of 1 inch to 100 feet. If they were extended to cover the entire county they would consist of 260 sheets. It is believed that if the Bill mentioned is passed, the the plats provided, and the system put into operation, whereby a separate number is given to each block, square, lot, or parcel of land, avoiding the confusing similarity of names of the county sub-divisions and the duplication of lot numbers, the changes resulting will be of incalculable benefit, both to the owners of real estate in the county and to the district government."

The legislation here referred to has now been secured.

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Transit.

In their Report for 1897 the Commissioners state that air motors had been tried for street-car propulsion, but they were being discarded in favour of the underground electric system (*i.e.*, what is known here as the conduit system). They proceed :—

> "It is a question for serious consideration whether sound public policy would not dictate that until some other method of street-car propulsion has been proved to be better, Congress should stipulate that all street railway companies operated within the city limits be equipped with this form of propulsion, as being the most satisfactory known anywhere at this date. The equipment of all lines in the city on a uniform plan would afford advantages which can be readily seen in permitting the transfer of cars from route to route, in permitting eventually the abandonment of some miles of track, and in lessening liability of a line being tied up by accident."

Two years later the Commissioners record the opening of "a new era in the street railway history of the district." All the lines, with two exceptions, had been consolidated under one management, termed the Washington Traction and Electric Company. Free transfers were given at all connecting points of these various lines, except at such places where the issue of transfers would make possible a perpetual ride for one fare. Although under one management the organisation of each company was preserved.

In the following year (1900), it is recorded that the suburban street railways of the city had been re-built and re-equipped.

In 1902, the Commissioners report on a Bill which had been forwarded to the Senate and House Committees on the District of Columbia. The principal objects of this measure were to confer upon the Commissioners power to regulate the size and weight of street cars and also schedules, routes, and transfer arrangements ; to require the cars to be kept in proper condition ; to be heated during cold weather, to be equipped with emergency brakes in certain cases, to require the companies to provide waiting rooms at transfer points, and to permit suburban cars to run into the city of Washington. The Bill provided also for the registration and regulation of all motor vehicles running upon the streets of the district.

In the conveyance of the street franchises to the companies admirable arrangements had been made in respect of construction. But the control of working in relation to the general traffic had not been reserved. The reports of the Commissioners year after year contain the official orders they had issued for traffic regulation and, except where the companies were concerned, they were effective. But the Commissioners were made to realise that over the working of the street railways their authority was limited. Even the policing of the services was in the hands of the companies, as the following extract from the Report of the Superintendent of Police for 1903 will show :—

> "The special policemen who are employed at street railway crossings are instructed to see that the police regulations are enforced respecting the movements of cars, to reduce the speed of vehicles and bicycles, to assist the old and young in transferring from one car to another, and to generally assert their authority as policemen when warranted in so doing. These employees are subject to the rules governing the metropolitan police force, but have shorter hours and receive the same pay as members of Class 1 in the regular force. They accomplish a great deal of good in preventing accidents and make a favourable impression. Your superintendent is of opinion that they should be allowed a leave of absence annually, and that some provision should be made for their relief in case of injury in line of duty, but being paid by the railway companies it is beyond his control."

It is clear that if the Bill framed and presented by the Commissioners in 1902 were to pass into law there would result, along with control, an addition to the expenditure of the District ; and it was probably this consideration which caused delay in the proposed legislation.

But according to the Police Report for the year 1904 the whole traffic of Washington and the District generally was in need of control :—

> "The regulation of public vehicles is a matter which receives the attention of the police, and, while improvements in the service have been noted, the absence of a general law on the subject has made the work irksome and at times complicated. It is the opinion of the Commissioners that the public-vehicle service would be more satisfactory if drivers were granted licenses upon the favourable recommendation of the police, and if licences were issued to drivers instead of to owners. This change would necessitate an amendment to the existing license law. In view of the approaching construction of a new railroad terminal these questions are of the utmost importance."

In the previous year the Commissioners adopted Regulations governing the operation of automobiles. These became effective on August 29, 1903, and in 1904 the Commissioners report under that head as follows :—

> "The automobile regulations have been enforced during the year with impartiality, and the number of complaints for exceeding the speed limit are now comparatively few. The regulations, while not as severe as those enacted in many States, have been effective. The total number of permits issued from the date of the promulgation of the regulations until June 30, 1904, was 858."

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Washington, U.S.A.

In the police report for 1903 there is a remarkable testimony to the natural improvement in the traffic which somewhat discounts the demand for legislation :—

"The officer detailed as inspector of hacks makes a detailed report of affairs connected with his work. When conditions as they existed five years ago are recalled a change is apparent. This is not altogether due to the action of the authorities. The perfection of the street railway service and the adoption of motor vehicles has tended to improve the character of one and two horse vehicles for hire."

But legislation on the Bill, introduced into Congress in 1902, is again urged by the Commissioners in 1904, and their position is stated as follows :—

"The Commissioners would again invite the attention of Congress to the Bill introduced at their request giving them the authority to regulate the operation of street railways in the District of Columbia. The charters of the existing street railway companies, while placing upon the Commissioners certain duties, such as the approval of time schedules, &c., fail to give them authority to enforce by penalties the observance by the railway companies of the directions of the Commissioners. As a consequence, though the Commissioners may make such regulations for the benefit of the public, they may be entirely disregarded by the railway companies. Such is especially the fact in regard to the time of operations of cars, and there is a great public demand for a better service on certain of the suburban lines which act as feeders for the city lines.

"The Bill in question was drafted by the Commissioners with the assistance of a Committee representing the various citizens' associations of the District of Columbia, and it is believed to be fair both to the railway companies and to the public. The Commissioners would earnestly recommend the passage of the Bill during the next session of Congress.

"The Eleventh Street Extension of the Anacostia and Potomac River Railroad to Lydecker Avenue, authorised by Act of Congress approved 1st July, 1902, has just been completed and cars are in operation thereon."

On the 31st March of the present year (1908), a Bill was pending in Congress to give the Commissioners adequate control over the street railways, thus making good the deficiencies in the charters in not providing the necessary penalties.

SUMMARY AND CONCLUSION.

The division of expenditure between the Central Government and the District was founded upon the municipal outlook of 1878, and did not contemplate the demands that have been made upon the municipality owing to a rapidly developed urban movement during the past quarter of a century.

In presenting their estimates for the fiscal year ended June 30th, 1907, the Commissioners again distinguish between extraordinary and current expenditure, and again deprecate the method of meeting extraordinary charges by temporary advances. Their representations on this point show that although directly appointed by the President of the United States, and although under the strict financial control of the Treasury, the Commissioners speak on behalf of the District with a strength and an independence which could scarcely be greater if they were the elected delegates of a municipality.

By placing the local administration of the seat of government under the control of the Central Authority of the United States, the City of Washington was effectually rescued from a state of chaos which threatened to obliterate the noble lines on which it was originally planned. A further effect is that a standard has been set which is not without influence on municipal matters throughout the country. Washington has become an object lesson in efficient local administration, and the policy which included the special care of the capital among the highest affairs of state has been justified by the result.

Improvement is constantly going on. In 1905, Congress amended the code so as to provide better procedure for condemning minor streets and alleys in the City. As in Germany, the object in view is always wide thoroughfares and Sylvan spaces. The Boulevard of Paris is the ideal of Washington. In a recent report the Commissioners (in their own words)—"Again invite attention to the desirability of legislation with the object of preserving Sixteenth Street as a permanent residence street, and the limiting to a still greater degree the height of buildings along this street. The development of Sixteenth Street as a great Boulevard is deserving of the most careful consideration at the present time, and parks along its length are extremely desirable."

It has been shown how anxious the Commissioners were to extend their power of police in the District, and to obtain more complete control over the tramways and other means of locomotion. Although their appeals to Congress have not met with invariable success, the inference suggested by a perusal of their voluminous reports is that their representations are addressed to a sympathetic audience and are received with approval even when not acceded to.

The series of reports of the Commissioners of the District of Columbia are a record of vigilant administration in all the branches and details of municipal affairs. One of the recent improvements is the "elimination of grade crossings." Bridges have been their and tunnels made to carry the railroads over and under the crossings.

With the annual reports of the Commissioners are presented those of the Engineer of the Highways of the District, given in great detail and testifying to the care bestowed upon this Department of the municipal work. The streets of Washington are celebrated throughout the United States as models of paving.

The following has been communicated as the present street mileage of the District of Columbia :— Washington, U.S.A.

Statement of character and extent of street pavements June 30th, 1907.

Section.	Asphalt and coal tar.		Asphalt block.		Vitrified block.		Granite.	
	Square yards.	Miles.	Square yards.	Miles.	Square yards.	Miles.	Square yards.	Miles.
Northwest	1,777,292	81·66	33,609	1·97	18,630	0·68	135,426	6·92
Northeast	271,746	13·93	191,604	7·79	—	—	13,567	·89
Southeast	159,706	9·26	213,081	10·06	—	—	49,940	2·55
Southwest	157,023	8·63	52,697	2·66	3,005	·20	199,620	10·55
Georgetown	129,957	7·93	14,837	·65	780	·04	54,198	3·27
Suburban	302,634	16·85	53,781	3·13	—	—	31,713	1·70
Total	2,798,358	138·26	559,609	26·26	22,415	·92	484,464	25·88

Section.	Cobble.		Macadam.		Gravel and unimproved.		Total.	
	Square yards.	Miles.	Square yards.	Miles.	Square yards.	Miles.	Square yards.	Miles.
Northwest	68,504	2·92	47,645	2·97	73,004	4·00	2,154,110	101·12
Northeast	—	—	66,958	4·01	227,954	12·62	771,829	39·24
Southeast	12,641	·54	67,034	4·00	276,309	15·07	778,711	41·48
Southwest	87,873	3·78	34,472	2·00	128,889	7·75	663,579	35·57
Georgetown	15,943	·91	14,904	·84	24,301	1·42	254,920	15·06
Suburban	—	—	1,059,557	67·89	1,345,185	118·00	2,792,870	207·57
Total	184,961	8·15	1,290,570	81·79	2,075,642	158·86	7,416,019	440·04

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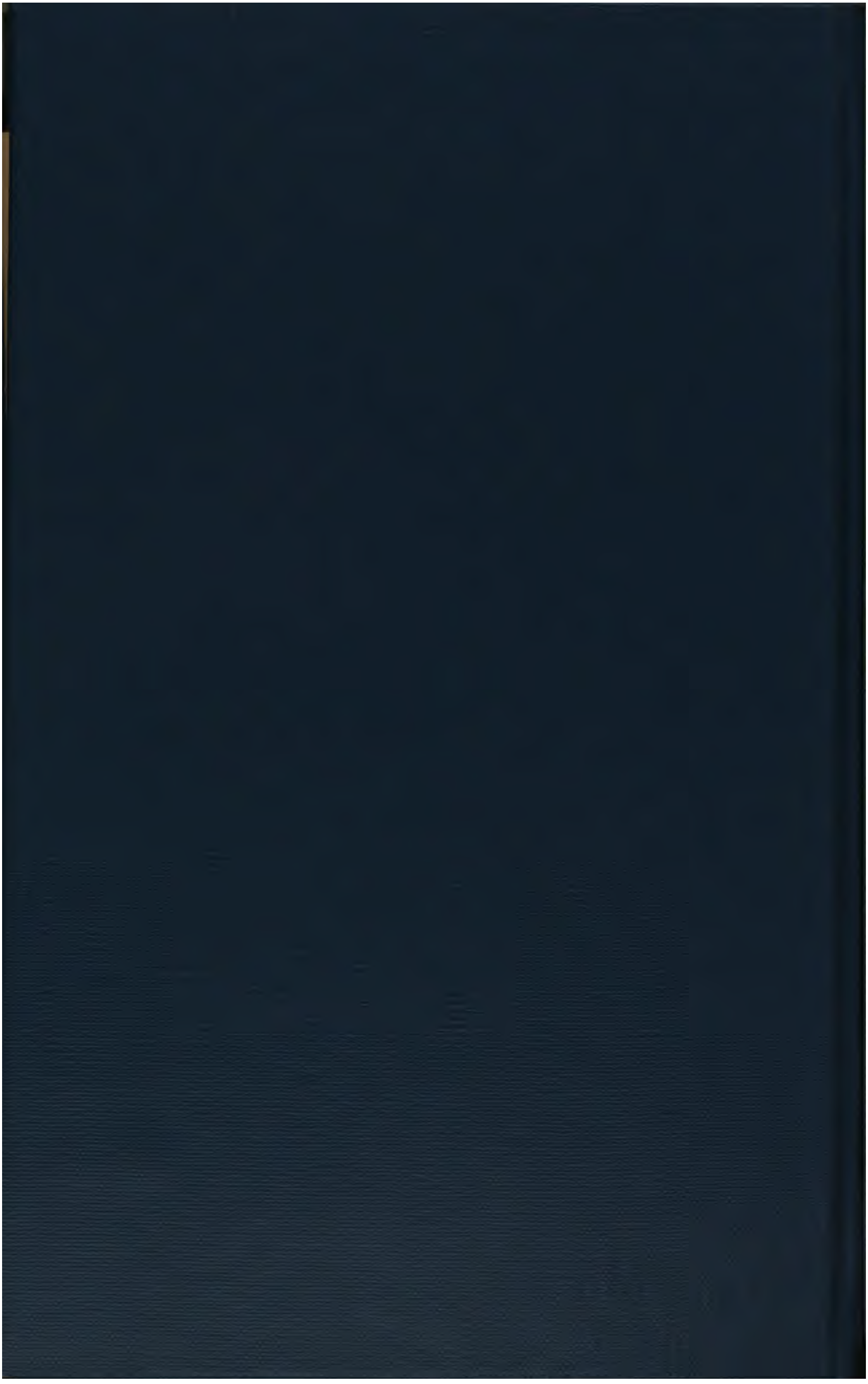
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